THE ROME (FORUM) HOARD OF 1883

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In 1985 the writer visited the Museo Nazionale Romano in order to complete a study of the Forum hoard, which the Museum wished to see published, partly as a security measure, and of which they had prepared a complete set of enlarged photographs for the writer's use, after the coins had been cleaned. The typescript for a monograph on the hoard was completed in 1986. After some delay it has been translated into Italian, and it is to appear in the Bollettino di Numismatica, *with illustrations of all the coins. For the convenience of English-speaking students, the introduction to the monograph is published here in its original form, together with the tables summarizing die-duplication (which was carefully verified from the enlarged photographs) and other statistical aspects of the hoard. The section on non-destructive chemical analysis has had to be omitted. Otherwise, only very minor changes have been made to the text of 1986. A lecture based on the section, 'The Pattern of Supply of the Portrait Dies', was delivered before the Society in February, 1987.*

INTRODUCTION

The Rome (Forum) hoard of 1883, containing more than 800 Anglo-Saxon coins, reflects a gift sent from England for Pope Marinus II (942–6). It is, with the even larger Cuerdale hoard, a major source of information about the English currency in the phase of nearly a hundred years running from Alfred's reforms of the coinage to Eadgar's reform (*c.* 878–*c.* 973). A great deal is known about the Anglo-Saxon coinage from *c.* 973 onwards because of the tens of thousands of coins that have been found in Scandinavia. For the first three quarters of the tenth century the total number of surviving coins is far smaller, and the English hoards and grave finds generally each contain only a handful of coins. The Forum hoard is precious because it provides, from a period in which evidence of any kind is scarce, a sample of the currency which is large enough to do justice to the complex arrangements for minting coinage which existed in England from the 880s onwards; large enough, also, to lend itself to statistical analysis; and (unlike most English hoards) representative of all regions of England.

British numismatists would think it axiomatic that the hoard deserves to be published and analysed in the greatest possible detail, with illustration of every coin. No effort could be too much, for a historical source of such major importance. It has been published twice before, but without full illustration and without systematic discussion of its composition. The first publication was by G.B. de Rossi, within months of the hoard's discovery.[1] He catalogued the coins according to the kings whose names they bear, and recorded very exactly the names of the moneyers, which are such a prominent feature of the tenth-century Anglo-Saxon coinage. Where the coin legends record the mint-place as well as the moneyer's name, he was able to interpret those too. Most of the coins, however, do not name their mint. This is our greatest difficulty in interpreting the coinage. We know from documentary and other sources that from very early in the tenth century there were mints in about thirty towns in England. The number grew until by the end of the tenth century there were mints in about sixty towns. If we could assign every tenth-century coin correctly to its mint (as we can in the eleventh century) the

[1] R. Lanciani, *L'atrio di Vesta. Con appendice del Cv. B. de Rossi* (Rome, 1884).

opportunities for a topographical and regional analysis of mint-output and monetary circulation would, obviously, be dramatic. If a coin does not name its mint, however, it can be attributed only through a variety of considerations, of which its style is the crucial consideration. De Rossi was in no position to explore the question of style. His publication is, nevertheless, of permanent value as a guarantee of the exact contents of the Forum hoard.

The second publication was by C.E. Blunt in 1974. As the doyen of his generation of tenth-century numismatists, he was able to bring a profound knowledge of the series to a reconsideration of the moneyers' names and the attributions of the coins. He published illustrations of about a hundred of the most important coins of Athelstan in the hoard, as part of his systematic study of the coinage of that reign.[2]

Since 1974 two major advances have been made. First, Mr Blunt and his colleagues Mr C.S.S. Lyon and Dr I. Stewart (now Lord Stewartby) have jointly written a monograph, *Coinage in Tenth-Century England*, embodying much fundamental and new research. The completion of their work, based on a photofile of all known specimens, in public collections, sale-catalogues, etc., and on a comparative analysis of all known hoards, allows us for the first time to address ourselves confidently to the problem of the regional composition of the Forum hoard. Secondly, the coins have been cleaned. When de Rossi and Blunt studied them, they were still encrusted with a powdery clay incrustation, which made some of the readings difficult, and was certainly a hindrance to the assessment of style. Although the coins are brittle (particularly those of Edward the Elder), their state of preservation is superficially splendid. After cleaning, the coins have also been photographed, with great skill. For purposes of study, a complete set of enlargements was made, at twice natural size.[3] The benefits for study of these superb enlarged photographs cannot be overstated. They enabled the writer to determine with certainty the extent of die-duplication in the hoard. Even with such carefully made and relatively elaborate dies as were usual in tenth-century England, die-identity can be deceptive. The metal flows into the die differently at successive strikings. Enlarged photographs permitted a definite judgement, when the writer would have quailed before reaching a decision from a natural-size photograph or even from the coins themselves. No effort was spared to ensure that the die-duplication within the hoard should be recorded fully and accurately.

The coins have also been weighed (for the first time). Here again, the benefits of a statistically adequate sample are evident. Wide tolerances were permitted; and small variations in the average, or in the degree of dispersion, between different mints or between different phases of the coinage can only be established by the careful weighing of hundreds of coins. Moreover, if one is looking for small variations, it is essential that all the coins in the sample should have had the same history. The loss of weight by wear and (more important) by leaching while the coins are buried in the ground for centuries, may vary from one hoard to another, by a greater amount even than the variations one is seeking to establish.

With the friendly collaboration of Dr Patrizia Petrillo Serafin, of the University of Rome II, it has been possible to analyse non-destructively the metal contents of a selection of the Forum hoard coins (again, for the first time). The number of accurate analyses of coins of, for example, Athelstan hitherto available was only 15, a totally inadequate sample for the study of a complex coinage. The results show that almost all the coins were of reasonably good silver, with only moderate variations, the averages being around 90 per cent., but declining to around 85 per cent. Under Eadmund, there may have been a tendency for the quality of the silver to decline a little further. Canterbury seems to have worked to a slightly lower standard than most of the major mints. But the main point for the monetary historian is that all the coins

[2] C.E. Blunt, 'The coinage of Athelstan, 924–939: a survey', *BNJ* 42 (1974), 35–160.

[3] I am much indebted to the authorities of the Museo Nazionale Romano, who placed every facility at my disposal for the study of the hoard.

were evidently of the same nominal fineness, and that such small variations as in practice occurred were not recognizable to the eye and will not therefore have attracted dishonest manipulations or culling of the currency. Nor will the mixing in circulation of coins minted in different regions have been influenced by any considerations of acceptability based on intrinsic value.

Recent advances in our understanding of the tenth century, then, combined with technical advances in the cleaning, photography, and scientific analysis of the hoard, present opportunities for a more exact, detailed, and thorough investigation of the Forum hoard. The work has been undertaken from the standpoint of a monetary historian, with the intention of understanding the character of the hoard and relating it to our knowledge of English monetary history. The exemplary decision, by the Keeper of the Coin Cabinet of the Rome National Museum, to publish a catalogue of the hoard in which every coin should be illustrated, and the very high technical standards of production in the *Bollettino*, serve to place a full factual record of the hoard before the learned world. Further advances in our understanding of the coins will doubtless be made in the future – whether through comparisons with the hoards which the future will bring to light, or through persevering research which strives to understand the work of the mints more fully – and scholars will no doubt need to handle and to re-examine the coins from time to time. But in so far as a full objective description of the coins can be set down on the printed page for the benefit of students everywhere – photograph, weight, die-axis – that task has now been completed.

Circumstances of discovery

The hoard was found on 8 November 1883 in the course of archaeological excavations by R. Lanciani of the Aedes Vestae and its atrium, in the Roman fora. By good fortune, de Rossi was present when the unexpected discovery was made. According to Lanciani's account, 'the pot containing the treasure was buried in the fill, at a height of 1.60m above the level of the atrium. That means that the floor of the room must have been somewhat higher [about 90 cm higher?]'. The hoard was concealed beneath the floor of a ninth- or tenth-century building at the north-eastern corner of the atrium which abutted onto the House of the Vestals. De Rossi's description of the find-spot is that 'the coins and the fibula were in a vessel of coarse clay hidden under a large stone within the space of a room of medieval construction'.[4]

Summary of the contents of the hoard

The hoard as listed by de Rossi consisted of one gold and 834 silver coins plus a pair of silver hooked tags (now thought to be of Anglo-Saxon workmanship) inscribed with the name of Pope Marinus. The catalogue below describes 839, rather than 835, coins, but this total includes five or six fragments which may well belong to other, broken coins, i.e. it should be assumed that the original total was probably at least 840. All but six of the coins are English or Northumbrian Viking. To mention briefly the non-English coins first, they are: one gold Byzantine coin a hundred years old; two denarii of Pavia, of which one was quite recent at the date of concealment; a denar of Otto I minted at Strasbourg, and a ducal denar of Regensburg, similarly not more than eight or ten years old; and a denier of Limoges, not precisely datable, but evidently of the tenth century.

[4] Lanciani, p. 487.

The 833 English coins which were the main component of the hoard were of the following rulers:

Kings of Wessex, and subsequently of all England	
Alfred, 871–99	6
Edward the Elder, 899–924	213
Athelstan, 924–39	396§
Eadmund, 939–46	198†
Unidentified	6
Fragments	4
Archbishop of Canterbury	
Plegmund	4
Hiberno-Norse Kings of York (Northumbria)	
Anlaf Guthfrithsson, 939–41*	1
Anlaf Guthfrithsson or Anlaf Sihtricsson	1
Anlaf Sihtricsson, [927], 941–44, [948/9–52]	3
Sihtric (Sihtricsson), 941–2	1
	833

* One other, in the joint names of Anlaf and Athelstan, is counted in the total of coins of Athelstan.
† Including 802A.
§ Two of the six unidentified coins should have been listed under Athelstan, which would make 398.

Before cleaning, at least one coin (no. 595) bore traces of the closely-woven fabric in which the hoard had been contained.

The age-structure and regional composition of the hoard

It is virtually certain that all the types of English coins represented in the hoard normally circulated in England at a uniform face value of one penny, in spite of any variations in their weight or alloy. If English money was exported, it would no doubt lose its fiduciary character, and would be accepted by weight on a conservative estimate as to its fineness. Similarly, it seems possible that in large transactions within England, coins were weighed rather than counted. But for most transactions, including the payment of tolls and taxes to the king, we may assume that a silver penny was accepted at face value.

After the introduction of Alfred's two line type in the 880s, we have no reason to think that coins were officially withdrawn from circulation until 973. The age-structure of the currency therefore reflects, so far as we can see, the interaction of the original mint-output and the processes of natural wastage by export etc. If we divide the number of coins in the hoard, from each reign, by the number of years of the reign, we obtain a quotient in terms of 'coins per year' which is approximately 0.25 for Alfred, 8 for Edward the Elder, 26 for Athelstan, and 33 or more for Eadmund. The general trend is thus very clearly that coins fifty years old have almost disappeared from circulation, and that more recent coins are progressively more plentiful. It would of course be helpful if one could determine the trend more exactly, by dividing the coins of Edward and similarly those of Athelstan into two or three chronological groups – early, middle, and late in each reign. Athelstan's coins, in particular, are mostly divisible into two groups, namely the two line type, and the cross and 'portrait' types. The dates during which each group was produced are however uncertain enough to make the exercise of working out the age-structure of the hoard in those terms of limited value.

We should try to be clear what the 'coins per year' quotient measures. It could reflect wastage from a currency that was being added to, by mint-output, at a steady rate; or it could

reflect changes in mint-output (a growing output through the first half of the tenth century) with wastage as only a minor factor. There are other ways of measuring mint-output (by die-estimation), and this aspect of the evidence will be considered below.

Our assessment of the age-structure of the hoard from these figures, then, will inevitably be rather general. The curve of representation in the hoard cannot be drawn in more detail because of the impossibility of dating individual coins precisely.

Let us turn next to the question of cutting the cake the other way, by asking how the coins are divided between the regions of England where they were minted. We have said, above, that there were at least thirty mints at work. Their location is shown on the map (Fig. 1). Sometimes the mint is named on the coin. Usually, it is not. In the latter case, the style of the coin is the main guide to its attribution. What do we mean when we speak of 'style' in the context of tenth-century numismatics? – The dies for the coins seem to have been made at only nine or ten centres, doubtless in the towns where the most active mints were located. From these centres, dies were distributed to the lesser mints on a regional basis. Each die-cutting centre has a recognizable 'style', in the same way as individuals have recognizable handwriting. This is demonstrable from those coins which bear the name of a mint. For the coins with no mint-name, their style allows us to decide at least which region they belong to, even if we cannot tell which town within that region. The regions associated with each die-cutting centre seem to have corresponded approximately with the historic kingdoms of Wessex, Kent, Mercia, Northumbria, East Anglia, etc., which had been or were being amalgamated into the unified Kingdom of 'All Britain' under the West Saxon royal dynasty. The traditional boundaries of these kingdoms were very persistent, and in many cases they survived as diocesan boundaries until the reformation and, even, as administrative boundaries until the local government reorganization of 1974. Regions based on the die-cutting centres, which means usually on the old eighth-century kingdoms, are therefore the sensible framework for any topographical analysis of the Forum hoard. Another consideration is that research on other hoards, and on monetary circulation generally, has been published using a regional framework, and it is desirable that we should, as far as possible, be able to compare one piece of research with another.

The ten regions which have been used for the analysis of the Forum hoard are shown on the map, Fig 1. Following the same geographical pattern as the fortified boroughs, the mints are concentrated in Southern England, south of the river Thames. In the eleventh century the same mints continued in operation, and we know that at that time there were wide differences in their levels of activity. A major mint such as London might produce a hundred times as much coinage as a very small mint in south-western England. The mint-signed coins in the Forum hoard indicate that something similar was true in the tenth century. We cannot quantify that aspect of the evidence, because there are so many coins in the hoard with no mint-signature. But is very safe to assume that the variation between large and small mints was almost as great if not as great in the tenth century as in the eleventh. The reality is that the seven or so major mints of London, Winchester, Canterbury, Chester, and one or more unnamed mints in the North-East, together with Norwich and York, accounted for at least three-quarters of the total English output.

All ten regions seem to be well-represented in the Forum hoard, which is in marked contrast in this respect to hoards found in England. They tend to show a distinct regional bias in their composition – particularly those from the North-East, from East Anglia, and from Northumbria. The currency of the north-western (Chester) region, too, tended to show a regional bias. The obvious conclusion is that the Forum hoard reflects a sum of money withdrawn from a central treasury, perhaps the royal treasury at Winchester, or perhaps the treasury of the archbishop of Canterbury.

One can think of ways of testing that idea more rigorously, by relating the percentage composition of the hoard (Table 1b) (a) to the amount of die-duplication in the hoard, region by region (Tables 2, 3), and (b) eventually, to estimates of mint-output for each region based

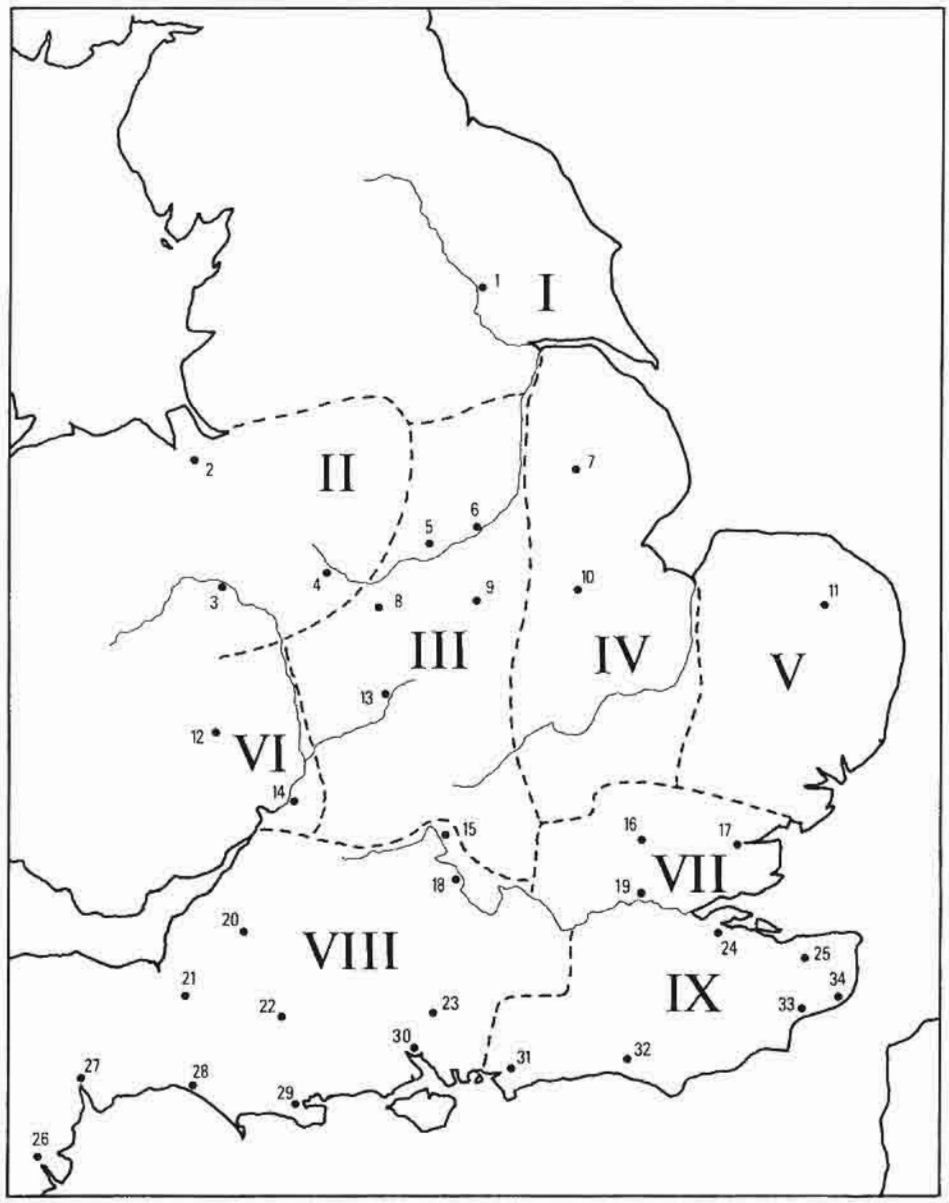

Fig. 1. Mints and die-cutting regions.

Mint towns

1	York	16	Hertford	31	Chichester
2	Chester	17	Maldon	32	Lewes
3	Shrewsbury	18	Wallingford	33	Lympne
4	Stafford	19	London	34	Dover
5	Derby	20	Bath		
6	Nottingham	21	Langport	Regions	
7	Lincoln	22	Shaftesbury	I	York
8	Tamworth	23	Winchester	II	Mercia: north-west
9	Leicester	24	Rochester	III	Mercia: midland
10	Stamford	25	Canterbury	IV	NE I
11	Norwich	26	Totnes	V	East Anglia
12	Hereford	27	Exeter	VI	Mercia: western marches
13	Warwick	28	Bridport	VII	London (Essex)
14	Gloucester	29	Wareham	VIII	Wessex
15	Oxford	30	Southampton	IX	Kent

on a larger and more random sample. Exercise (b) would be an accurate way of measuring variations in the survival-rate, and would show reliably whether the coins minted in some regions were more heavily represented in the hoard, in relation to mint-output, than those from other regions. Similarly it would show whether the survival-rate of the more recent coins was greater, and whether the representation in the hoard of certain types, e.g. portrait coins, was above expectation. All these investigations depend, for their rigorous performance, on systematic die-studies which remain to be undertaken in the future, and our analysis of the Forum hoard is in that sense an investment for the benefit of others, a sowing, for others to reap. That is because the hoard is (demonstrably) not a completely random sample in respect of the dies represented in it. Even allowing for the unequal use of dies, some of which no doubt produced many fewer coins than the technical maximum, it is clear that the hoard contains many little 'clusters' of coins which share a die. When merchants or other customers obtained coin from a moneyer, they were given a batch of coins which were presumably all struck from the same die, or at least from very few dies. Through the normal processes of commercial exchange, such groups of die-duplicates gradually became dispersed. (Similarly today we may often notice that we are in possession of two or three bank-notes with consecutive numbers.) It should not surprise us if the process of randomization or homogenization of the currency, as reflected in a hoard such as the Forum hoard, was not quite complete. If it were complete (and if the output of each die were equal), the ratio of die-duplicate coins to triplicate or quadruplicate coins, etc., would be in accordance with statistical expectation, and there would be far fewer triplicates than duplicates, and far fewer quadruplicates even than triplicates. When we find, therefore, that from the most recent reign represented in the hoard there are runs of as many as nine or ten die-linked coins, it should be obvious to us that clustering is seriously distorting the randomness of the sample. In these circumstances, estimates of the total numbers of dies employed, based on the hoard, will automatically be under-estimates. It still remains open to us, as a substitute for (a) above, to calculate a ratio between the number of specimens from a particular region, and the estimated number of dies used in that region (an estimate based only on the Forum hoard, and therefore probably an under-estimate). This ratio will give an approximate measure of the relative *representation* of coins of different regions in the hoard, and we might hope that it would at least be rather more reliable than information in Table 1b. But the possible errors would seem to be too variable to assess.

The above theoretical and critical background to the numerical analysis of the Forum hoard should have made it clear how necessary it is to try to assign all or almost all of the coins correctly to their region. If a substantial proportion of the coins were left in the 'uncertain' category, the same or greater margins of uncertainty would be transferred to any conclusions drawn from the study. Hence the constant preoccupation with style, and with any other clues which can be found to assist in the regional attribution of the coins.

Table 2 lists the die-duplication in the hoard, and Table 3 summarizes it. Table 4 shows the estimates of mint-output as calculated from Table 3 and the representation of coins of the various regions (using the figures derived from Table 1). A word of explanation should be added about the statistical procedure adopted to estimate the original totals of dies. A formula which remains valid in the circumstances where the output of individual dies is unequal is to be preferred. Good's formula, developed for biological research and applied to numismatic use by Lyon, is valid in this respect and has the merit of being very simple to calculate. It can be summarized as

$$\frac{\text{non-singletons}}{\text{sample}} = \frac{\text{no. of dies represented in sample}}{\text{original number of dies}}$$

The answer in its simplest form is a percentage: the sample reflects a certain percentage of the original output. The formula is a measure of the proportion of a coinage struck from the dies so far recorded. We may if we choose express this in terms of numbers of dies, and say that

the original total of *dies* is in proportion to the sample. This involves the assumption that the average output of the missing dies is similar to that of the known dies. Where the sample is fairly complete, the probable degree of error is not serious.[5]

Tables 2a, 3a, and 4a give a more detailed analysis for the coins of Athelstan (924–39) broken down into the three main types which, in southern England at least, were broadly speaking chronologically successive. The analysis reveals that the portrait coins (which are such an exceptional feature of the Forum hoard) have a very much higher representation rate than the other coins of Athelstan. The figures are as high as for the following reign. The crowned bust coins are admittedly the last issue of Athelstan's reign in the south, and might be expected to show a higher representation rate, approaching that for Eadmund's coins. But the difference between the cross and the portrait types is pronounced, and some special explanation seems to be called for. Two possible explanations for this phenomenon should be considered. Either the average output of the individual dies in the portrait type was much higher, or portrait coins were deliberately selected for inclusion in the hoard. One can imagine that portrait dies were more difficult and costly to engrave, and that efforts might therefore have been made to use them more fully. If this were the case, however, we would expect to see a significantly higher ratio of reverse to obverse dies in the portrait type, which we do not. The weak impression of the obverse die noticeable on some portrait coins may well imply that some individual dies were heavily used; but the overall figures are no different from those for non-portrait types. There is a strong presumption, therefore, that portrait coins were preferentially selected for inclusion in the hoard, perhaps for propaganda reasons.

The mixture of different representation rates among the coins of Athelstan has the consequence that estimates of the original numbers of dies calculated for all three types together will automatically tend to be under-estimates. Better figures are obtained by calculating separately for each of the three types, and then adding the answers together. This procedure has been followed in Table 4, which derives in part from Table 4a rather than from Table 3.

The general conclusions to be drawn from the figures in Table 4 are, it may be suggested, as follows.

1. The estimated total numbers of dies show a sharp increase, from *c.* 800 in the reign of Edward the Elder, to *c.* 1600 in the reign of Athelstan. The figure of roughly 500 for Eadmund's reign is not necessarily comparable, both because the hoard may have been concealed before his issues were complete, and because the coins in the hoard are probably a less well mixed sample, having spent a shorter time in circulation. As the coins of Eadmund in the hoard reflect a period of at most seven years, compared with fifteen for Athelstan, and taking into account the two distorting factors just mentioned, we should hesitate to conclude that there was a reversal of the trend. The annual rate of mint-output for England as a whole may have remained approximately level before and after 939.
2. The over-all rates of representation in the hoard are no greater for Athelstan than for Edward. This statement is superficially in conflict with what was said earlier about the age-structure of the hoard, namely that the number of 'coins per year' increased from 8 under Edward to 26 under Athelstan. We can now see that the jump from 8 to 26 is not accounted for by the processes of wastage from the currency. It reflects rather the fact that Athelstan's coins were minted from twice as many dies. The distinctly higher rate of representation for the reign of Eadmund – up to twice as high – should be assessed cautiously. It may reflect little more than the fact that the estimated total of Eadmund's dies is an under-estimate.
3. If we look at the figures region by region, the most striking feature of the evidence is the contrast between southern England (Wessex, London, and Kent) and north-western Mercia (i.e. the Chester region). In relation to the estimated total numbers of dies, a far smaller proportion of

[5] G.F. Carter, 'Comparison of methods for calculating the total number of dies from die-link statistics', *Statistics and Numismatics* (= Pact 5, 1981), 204–213; S. Lyon, 'Die estimation: some experiments with simulated samples of a coinage', *BNJ* 59 (1989), 1–12.

the Mercian coinage has entered into the composition of the hoard. This is true for all three reigns. Why it should have been so is a matter for speculation, which depends on our idea of how the hoard was put together. If it reflects money withdrawn from circulation in southern England, the explanation might be that Mercian coins had penetrated the currency of southern England only to a limited extent. If on the other hand it reflects money from a royal treasury, filled by means of taxation from all the regions under the king's control, the contrast is more puzzling. The figures from the other regions north of the Thames ought to help us to decide between the two hypotheses, or to strike a balance between them. For the North-eastern I region, the rates of representation for Athelstan and Eadmund are clearly in line with southern England, and offer the same contrast with north-western Mercia. For East Anglia under Athelstan, the same is true. For North-eastern II and for York the numbers of coins are too small to permit any useful conclusions. Our provisional conclusion should, nevertheless, be that some special factors have affected the representation of the north-west Mercian coins. Either the region was more lightly taxed in relation to the output of its mints, or (perhaps the same thing, seen from another angle) a higher proportion of its coins went overseas, e.g. to Ireland.

4. If we try to compare the figures for Wessex, London, and Kent, the most conspicuous contrast lies in the higher rate of representation for London, particularly in Eadmund's reign, but also under Athelstan. When we observe the exceptionally large clusters of die-linked coins at London under Eadmund, we may ask whether this is not merely, again, a reflection of the incomplete mixing of the most recent coins in the hoard, and of a consequent underestimate of the number of dies used at London under Eadmund. Even so, the evidence perhaps points us towards the place where the hoard was put together. The high rate of representation for the London region under Athelstan is largely due to the exceptional number of portrait coins which, it has been suggested above, were chosen for inclusion in the hoard for propaganda reasons.

5. We should note that the estimated numbers of obverse and reverse dies are, overall, much the same, implying that they were used in a one-to-one ratio. (No systematic search was made for obverse die-links between moneyers, a few of which may well exist. It is very unlikely that they will affect the general conclusions sketched here.) If a ratio of approximately one-to-one was true overall, and there are no very obvious divergences from it, it is likely to have been true region by region. Variations in the ratio in individual regions should therefore probably be discounted as random fluctuations without real significance, particularly when the numbers of non-singletons (Tables 3, 3a) are small. The figures for north-western Mercia under Eadmund are an example. The calculated figure of 630 reverse dies depends on only 2 non-singletons, and would be roughly halved if one more die-link were included in the hoard. As the obverse figure of 238 is likely to be more reliable, the 630 has been arbitrarily halved in the bottom line of Table 4. The reader will see that a similar problem has been encountered for North-western Mercia under Athelstan in Tables 3a and 4a, and for North-eastern I under Eadmund.

6. A general impression of the pattern of representation in the hoard is given by the diagram, Fig. 2. It shows a cluster of trend lines, each connecting three points (for the three regions). Each region is shown separately, by two lines, one for the obverses and the other for the reverses. Taken all together, the lines suggest a general upward trend, and in the present state of our knowledge we should probably not attempt to speculate on the few lines which run counter to the trend. They may be without real significance, or there may be some cause which we are not in a position to discover. The generally upward trend between the reigns of Edward and Athelstan is at variance with the figures in the bottom line of Table 4. These are heavily influenced by the sub-totals for north-western Mercia, and are affected by the gaps in the tabulation. We should certainly prefer the interpretation which Fig. 2 offers. As regards southern England, the upward trend in representation reflects either wastage with a half-life of roughly twenty or twenty-five years, or a balance of hoarding and dis-hoarding in a treasury, which mimics the same situation. The age-structure of the Forum hoard is somewhat more

extended (it has been argued elsewhere[6]) than the age-structures of most English hoards of the tenth century. In these, presumably, wastage rates were higher than that calculated from the Forum hoard. The English hoards are few and mostly small, but if their information can be relied on, the comparison demonstrates that the Forum hoard is probably not a sum of money withdrawn from the currency at a single moment in the 940s, but reflects an element of longer-term hoarding, such as might occur in a treasury.

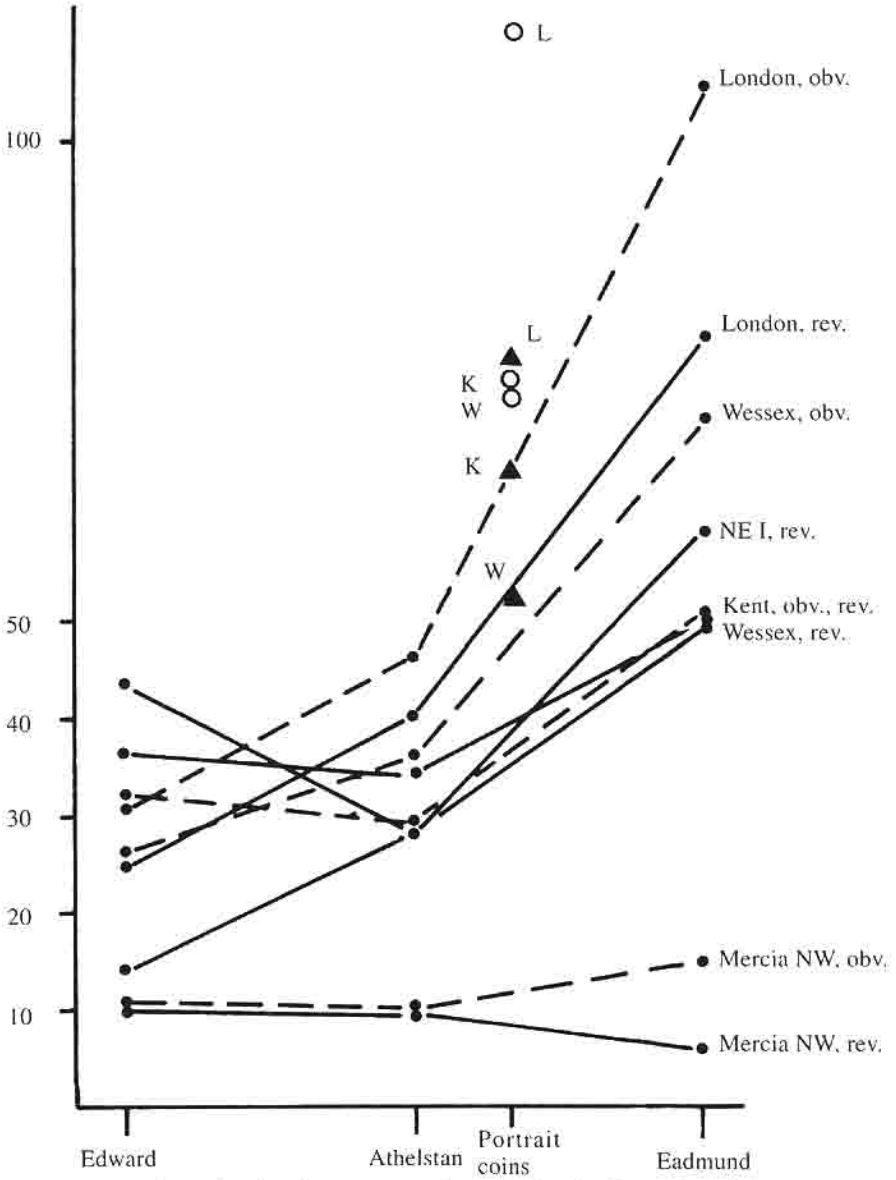

Fig. 2. Trend-lines showing the representation rates in the Forum hoard for the reigns of Edward, Athelstan, and Eadmund, region by region. The corresponding representation rates for Athelstan's portrait coins are shown by circles (obv.) and triangles (rev.) for Wessex, London, and Kent.

[6] D.M. Metcalf, 'The monetary history of England in the tenth century viewed in the perspective of the eleventh century', in *Anglo-Saxon Monetary History. Essays in Memory of Michael Dolley*, edited by M.A.S. Blackburn (Leicester, 1986), pp. 133–57, Fig. 8.5.

TABLE 1. Regional Composition of the Forum Hoard.

a) Numbers of coins.

	Alfred	Edward, Plegmund	Athelstan Diademed bust. Two line.	Cross	Portrait	Total	Eadmund, etc.	TOTAL
Wessex	3	81	1+13	22	27	63	39	186
London	2	53	2+16	14	52	84	53	192
Kent	1	22+4	22	5	31	58	35	120
(Southern)	–	–	7	–	–	7	–	7
Mercia NW	–	19	24	36	–	60	36	115
Mercia M	–	–	–	16	–	16	1	17
(Mercia)	–	–	1	–	–	1	1	2
NE I	–	17	58	–	–	58	16	91
NE II	–	6	3	–	4	7	4	17
E Anglia	–	11	–	–	15	15	9	35
York	–	–	–	22	1	23	6	29
Uncertain	–	4	3	1	–	4	3	11
TOTAL	6	217	150	116	130	396	203	822*

* Ten unattributed coins and fragments, which are omitted from the Table, make up the nominal total of 832 English coins.

b) Percentages

	Alfred	Edward, Plegmund	Athelstan Diademed bust. Two line.	Cross	Portrait	Total	Eadmund	TOTAL
Wessex		37.3	9.3	19.0	20.8	15.9	19.2	22.6
London		24.4	12.0	12.1	40.0	21.2	26.1	23.4
Kent		12.0	14.7	4.3	23.8	14.7	17.2	14.6
(Southern)		–	4.7	–	–	1.8	–	0.9
Mercia NW		8.8	16.0	31.0	–	15.2	17.7	14.0
Mercia M		–	–	13.8	–	4.0	0.5	2.1
(Mercia)		–	0.7	–	–	0.3	0.5	0.2
NE I		7.8	38.7	–	–	14.7	7.9	11.1
NE II		2.8	2.0	–	3.1	1.8	2.0	2.1
E Anglia		5.1	–	–	11.5	3.8	4.4	4.3
York		–	–	19.0	0.8	5.8	3.0	3.5
Uncertain		1.8	2.0	0.9	–	1.0	1.5	1.3
TOTAL		100	100	100	100	100	100	100

TABLE 2. Die-duplication within the Forum hoard

	Edward			Athelstan	Eadmund	
	Both dies	Obv. only	Rev. only	Both dies	Obv. only	Rev. only
Wessex	34, 35 42, 43 47, 48 55, 56 61, 62 66, 67 68, 69	49, 54 83–85	13–15 29, 30 49, 52–54 59, 60	See Table 2a	622, 623 627–30 631, 632 653–655	(622), 621 633, 634 643, 644 647, 648 (653), 656	641, 642 645, 646
London	99, 100 104, 105 120, 121 125, 126 133, 134	93, 94 (104), 106 (133), 132	89, 90		662–667 677, 678 684–693 699, 700 701, 702 709, 710	(662), 659 –661 (684), 681 695, 696 (701), 703	(684), 683 (703), 704
Kent	145, 146 150–152 159, 160		157, 158		717, 718 720, 721 730, 731 733, 734 740, 741	722, 723 (733), 735 (740), 739	715, 716 (739), 738
Mercia NW	168, 169				781, 782	762, 763 (781), 780	
NE I	193, 194	191, 192					785, 786 (324), 792 795–797
NE II						803, 804	

TABLE 2a. Die-duplication within the Forum hoard: Athelstan

	Diademed bust, Two line			Cross			Crowned bust		
	Both dies	Obv. only	Rev. only	Both dies	Obv. only	Rev. only	Both dies	Obv. only	Rev. only
Wessex	234, 235			383, 384 385, 386 390, 391	232, 392, 393		495, 496 499, 500 502, 503 513–515	(495), 494 507, 508	
London				397, 398 404, 405	(404), 406		529, 530 532, 533 537–541 543–546 548, 549 563, 564	522–527 534, 535 (537), 542 554, 555 556–560	523, 524 525–527 556, 557 558, 559, 561
Kent		256–258					571, 572 573, 574	(571), 575	

	Diademed bust, Two line			Cross			Crowned bust		
	Both dies	Obv. only	Rev. only	Both dies	Obv. only	Rev. only	Both dies	Obv. only	Rev. only
							580, 581 582, 583 587, 588 590, 591 593, 594	(582), 584	(593), 592
East Anglia							611–613	606, 607	(606), 608 609, 610
Mercia NW	293, 294				425, 426 427, 428				
Mercia M				454, 455 463, 464		(454), 456			
NE I	325, 326 330, 331 336, 337 341, 342 354, 355	311, 312 (336), 335 350, 351 365, 366	343, 344 358, 359						

TABLE 3. Die-duplication within the Forum hoard (summary)

	Edward, Plegmund					Athelstan					Eadmund				
	Sample	Non-single		Known dies		Sample	Non-single		Known dies		Sample	Non-single		Known dies	
		O	R	O	R		O	R	O	R		O	R	O	R
Wessex	81	19	25	71	67	63	25	19	49	53	39	19	15	27	30
London	53	14	12	45	47	84	38	31	58	65	53	31	26	29	33
Kent	26	7	9	22	21	58	19	15	47	50	35	14	14	27	28
(Southern)	–	–	–	–	–	7	0	2	7	6	–	–	–	–	–
Mercia NW	19	2	2	18	18	60	6	2	57	59	36	5	2	33	35
Mercia M	–	–	–	–	–	16	4	5	14	13	–	–	–	–	–
(Mercia)	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
NE I	17	4	2	15	16	58	17	14	49	51	16	0	7	16	12
NE II	6	0	0	6	6	7	0	0	7	7	4	2	0	3	4
E Anglia	11	0	0	11	11	15	5	7	12	11	9	0	0	9	9
York	–	–	–	–	–	23	0	0	23	23	6	0	0	6	6

TABLE 3a. Die-duplication within the Forum hoard (summary): Athelstan

	Two-line					Cross					Portrait				
	Sample	Non-single		Known dies		Sample	Non-single		Known dies		Sample	Non-single		Known dies	
		O	R	O	R		O	R	O	R		O	R	O	R
Wessex	14	2	2	13	13	22	9	6	17	19	27	14	11	19	21
London	18	0	0	18	18	14	5	4	11	12	52	33	27	29	35
Kent	22	3	0	20	22	5	0	0	5	5	31	16	15	22	23
(Southern)	7	0	2	7	6	–	–	–	–	–	–	–	–	–	–
Mercia NW	24	2	2	23	23	36	4	0	34	36	–	–	–	–	–
Mercia M	–	–	–	–	–	16	4	5	14	13	–	–	–	–	–
NE I	58	17	14	49	51	–	–	–	–	–	–	–	–	–	–
NE II	3	0	0	3	3	–	–	–	–	–	4	0	0	4	4
E. Anglia	–	–	–	–	–	–	–	–	–	–	15	5	7	12	11
York	–	–	–	–	–	22	0	0	22	22	1	0	0	1	1

TABLE 4. Mint output (dies) as estimated from the Forum hoard; and representation in the hoard (coins × 100/estimated dies)

	Edward				Athelstan				Eadmund			
	Estimate		Repres:n		Estimate*		Repres:n		Estimate		Repres:n	
	O	R	O	R	O	R	O	R	O	R	O	R
Wessex	303	217	27	37	170	185	37	34	55	78	71	50
London	170	208	31	25	177	209	47	40	50	67	106	79
Kent	82	61	32	43	199	208	29	28	68	70	51	50
(Southern)	–	–	–	–	(20)†	21	(30)	33	–	–	–	–
Mercia NW	171	171	11	11	582	576	10	10	238	630	15	6
Mercia M	–	–	–	–	56	42	29	38	–	–	–	–
NE I	64	136	27	13	167	211	35	27	?	27	?	59
NE II	–	–	–	–	?	?	?	?	6	?	150	?
E Anglia	–	–	–	–	36	24	42	63	?	?	?	?
York	–	–	–	–	(100)	(100)	(22)	(22)	?	?	?	?
Total	790+	793+	27	27	c. 1500	c. 1600	26	25	417+	872+	50	–
									–	557+	–	35

* The estimates for Athelstan's reign are derived from Table 4a, and are somewhat higher than those calculated from his three types taken together. For technical reasons, this was to be expected, because the portrait coins are more heavily represented in the hoard.

† Figures in parentheses are guesses, based on representation rates elsewhere in the table.

TABLE 4a. Mint output (dies) as estimated from the Forum hoard; and representation in the hoard (coins × 100/estimated dies): Athelstan

	Two line				Cross				Portrait			
	Estimate		Repres:n		Estimate		Repres:n		Estimate		Repres:n	
	O	R	O	R	O	R	O	R	O	R	O	R
Wessex	91	91	15	15	42	70	52	31	37	52	73	52
London	(100)	(100)	(18)	(18)	31	42	45	33	46	67	113	77
Kent	147	(150)	15	(15)	(10)	(10)	(50)	(50)	42	48	74	65
(Southern)	(20)	21	(30)	33	–	–	–	–	–	–	–	–
Mercia NW	276	276	9	9	306	(300)	12	(12)	–	–	–	–
Mercia M	–	–	–	–	56	42	29	38	–	–	–	–
NE I	167	211	35	27	–	–	–	–	–	–	–	–
NE II	?	?	?	?	–	–	–	–	?	?	?	?
E Anglia	–	–	–	–	–	–	–	–	36	24	42	63
York	–	–	–	–	(100)	(100)	(22)	(22)	?	?	?	?
Total	c. 800	c. 850	c. 18	c. 17	c. 550	c. 550	c. 21	c. 21	c. 170	c. 200	c. 76	c. 65

TABLE 5. Mean average weights of the coins in the Forum hoard (numbers of coins in parentheses)

	Edward	Athelstan				Eadmund
		Two line	Cross	Portrait	Total	
Wessex	1, 49 (77)	1, 46 (13)	1, 47 (22)	1, 51 (27)	1, 49 (62)	1, 47 (39)
London	1, 49 (53)	1, 43 (16)	1, 51 (14)	1, 51 (52)	1, 50 (82)	1, 51 (52)
Kent	1, 51 (22)	1, 39 (21)	1, 44 (5)	1, 47 (31)	1, 44 (57)	1, 32 (35)
Mercia NW	1, 47 (17)	1, 43(24)	1, 52 (36)	–	1, 48 (60)	1, 42 (36)
NE I	1, 47 (17)	1, 48 (58)	–	–	1, 48 (58)	1, 42 (16)
NE II	1, 50 (6)	1, 46 (3)	–	1, 43 (4)	1, 44 (7)	1, 32 (4)
E Anglia	1, 21 (11)	–	–	1, 56 (15)	1, 56 (15)	1, 58 (9)
York	–	–	1, 44 (22)	–	1, 44 (22)	1, 25 (6)

TABLE 6. Modal weights of the coins in the Forum hoard

	Edward	Athelstan			Eadmund
		two line	Cross	Portrait	
Wessex	1, 53	1, 55	c. 1, 54	1, 54	1, 52
London	1, 53				
Kent	c. 1, 54	c. 1, 37	c. 1, 37?	c. 1, 54	c. 1, 53?
Mercia NW	c. 1, 52	c. 1,52	1, 55	–	c. 1, 54
NE I	c. 1, 55?	c. 1, 55	–	–	c. 1, 53?
NE II	c. 1, 55?	c. 1, 55?	–	?	c. 1, 34?
E Anglia	?	–	–	c. 1, 62?	c. 1, 64?
York	–	–	?	–	c. 1, 35?

OTHER FINDS OF ANGLO-SAXON COINS FROM ROME, AND THEIR HISTORICAL CONTEXT

The Forum hoard is one of a number of English tenth-century hoards from Rome or its vicinity. The Vatican hoard, found in *c.* 1928, was concealed in *c.* 927.[7] The Forum hoard itself was concealed in *c.* 945. Another hoard found at Rome in or before 1846 can be dated to *c.* 950.[8] There are tantalizing references to at least one other hoard of the same general period, but the whereabouts of the coins is not now known.[9] It seems, then, that the second quarter of the tenth century has yielded exceptional numbers of Anglo-Saxon hoards, coinciding quite closely with the period during which Alberic was the powerful ruler of Rome and the Papal State.[10] English money will have been brought to Rome by pilgrims, and also it was sent from

[7] Mary A. O'Donovan. 'The Vatican hoard of Anglo-Saxon pennies', *BNJ* 33 (1964), 7–29.

[8] C.E. Blunt, 'Anglo-Saxon coins found in Italy', in *Anglo-Saxon Monetary History*, pp. 159–69.

[9] ibid., Hoard no. 6, found before 1859.

[10] P. Brezzi, *Roma e l'Impero medioevale (774–1252)* (Istituto di Studi Romani. Storia di Roma, vol. X), Bologna, 1947; P.D. Partner. *The Lands of St Peter. The Papal State in the Middle Ages and the Early Renaissance*, 1972.

the English king as an aid to the papacy, having been collected as a special tax on the English under the name of Romescot.[11] The name of King Alfred is linked with this tax. The judgement of Dr James Graham-Campbell (see below) that the hooked tags found with the Forum hoard are of English workmanship is of great importance for the interpretation of the hoard. It contradicts de Rossi's view that the tags were the fastenings of a cloak worn by a papal official. Toubert, in stating that the hoard was found on papal property ('la maison des Vestales sur laquelle était construite au X^{e} siècle une dépendance du palais des papes'[12]) is, obviously, going beyond the valid inferences that can be drawn from the archaeological evidence, and was perhaps influenced by de Rossi's view of the hooked tags.

Blunt suggests that 'there can be little doubt that it [the Forum hoard] represents a payment of Peter's pence to the Holy See lost in the troubled wars between Alberic, Prince of the Romans, and Ugo, King of Italy, in which the Pope took the side of the former'.[13] While it is a truth generally admitted by numismatists that troubled periods frequently yield a crop of hoards, whereas peaceful times may leave no such record for the student, the historical evidence in this case is difficult to reconcile with the standard explanation for hoarding. The attacks on Rome by Hugh of Provence were unsuccessful, and in any case lasted only until 942; the Forum hoard is from the heart of Alberic's territory; and relations between Alberic and the papacy were constructive. The Cluniac monastic reform proceeded actively in and around Rome, with considerable financial support. Alberic's rule was absolute: although he respected the papacy, his dealings with it in the 940s could be characterized by Benedetto di S. Andrea in the following phrase: 'papa Marinus non audebat adtingere aliquid extra iussio Alberici principis'. No obvious explanation suggests itself, therefore, for the failure to recover the Forum hoard. In this respect it is like many other hoards.

The four or five English hoards from the tenth century are by no means the only finds of Anglo-Saxon coins from Rome, although they are numerically the largest. Most of the other finds were discussed by C.E. Blunt and R.H.M. Dolley in an article in the *British Numismatic Journal* for 1957, and again at a paper read to an international congress in Rome in 1961.[14] Together, these form the essential work of reference, and there is virtually nothing that could be added to their detailed identifications of the coins, or their historical conclusions. Before summarizing the information they give, we may note one more recent find, a sceat of Type 48, minted *c.* 720–730, which is the only sceat recorded from Italy, and which is said to have been found at Ostia.[15] (A Merovingian coin of the same fabric, and a few years earlier in date, was found in the excavations at St Peter's.) Five Anglo-Saxon coins from the Confession of St Peter's,[16] and a further fifteen unprovenanced specimens also in the Vatican Library, are in sharpest contrast with the hoards, in their range of dates: they are spread from the late eighth century to the eve of the Norman Conquest in 1066, with no great emphasis on the tenth century.

The five excavated coins, which are of special value as evidence because their exact provenance is sure and because the sample is complete, are of King Ecgbeorht of Wessex (802–39), Æthelwulf of Wessex (839–58), Cnut (1016–35), Harold I (1035–40), and Edward the Confessor (1042–66).

The other coins in the Vatican Library are without provenance, but may be assumed to be either from the Vatican or from the Patrimony. They include three early coins of Offa

[11] P. Toubert, *Les structures du Latium médiéval* (Bibl. des Ecoles françaises d'Athènes et de Rome, vol. 221), 1973, esp. ch. VI/I, L'instrument monétaire, pp. 551–624.

[12] *ibid.*, p. 559.

[13] C.E. Blunt, 'The coinage of Athelstan, 924–939. A survey', *BNJ* 42 (1974), 35–160, at p. 141.

[14] C.E. Blunt and R.H.M. Dolley, 'The Anglo-Saxon coins in the Vatican Library', *BNJ* 28 (1957), 449–58; C.E. Blunt, *loc. cit.* (note 8 above).

[15] D.M. Metcalf, 'The Coins', *Excavations of Medieval Southampton* (forthcoming).

[16] B.M. Apollonj Ghetti *et al.*, *Esplorazioni sotto la Confessio di San Pietro in Vaticano*, 2 vols, 1951.

(757–96) and one of the contemporary ruler of Kent, Ecgbeorht, which may derive from a nineteenth-century hoard of great interest, alluded to briefly by Giulio di San Quintino, in the following terms: 'Uno ne fu dissotterrato, se ben mal ricordo, nel 1830, forse anche più ricco e copioso di quello di cui ora si ragiona, ma senza dubbio di più antica data, perciocchè nella piccolissima parte di esso che non è stata distrutta, io ho veduti denari di Offa rè della Mercia, dei due Pipini, di Eristal, cioè, e dell'Aquitania, e di parecchi altri principi, e città della Francia e dell'Inghilterra, proprî dei due secoli nono e decimo; ma fra questi non mancavano monete pontificie di que'tempi medesimi.'[17] It is impossible to believe that all the coins mentioned, ranging over two centuries, are from a single hoard. One can only speculate on what lay behind San Quintino's information, but eighth-century coins are so scarce that one may conjecture that a hoard of them was involved. If coins of Charlemagne were lacking, the date of this hoard is presumably just before *c.* 775, but the reference to Aquitanian coins of Pepin is puzzling.

A non-portrait coin of Offa, and one of Pepin, exhibited at the Royal Numismatic Society in 1843, and said to have been found in Rome,[18] may well derive from the same hoard, as may a little group of coins of Offa in the 1879 Borghesi sale,[19] without any record of provenance. In light of the unexpectedly high proportion of the scarce coins of this period in the St Peter's excavations we cannot however rule out the possibility of a number of separate finds – especially since it is on record that an excessively rare eighth-century coin of King Æthelberht of East Anglia, with the she-wolf and twins as its reverse type, was found in 1909 at the foot of the walls of Tivoli.[20]

The later Anglo-Saxon coins in the Vatican Library include specimens from the reigns of Coenwulf of Mercia (796–822) (2 specimens), Edward the Elder (2), Eadmund (1), Eadred (946–55) (2), Eadgar (959–75), Cnut (2), Edward the Confessor, and Harold II.

The eleventh-century hoard from the basilica of St. Paul, described by San Quintino, contained somewhat more than a hundred ('assai più di cento') Anglo-Saxon coins, including a good number of cut halves. Specimens of Edward the Confessor's Trefoil-Quadrilateral and Sovereign/eagles types were identified. There were earlier coins, too, of Æthelred and Cnut, and Irish coins, but San Quintino does not enter into details.[21]

There was one coin of Æthelred II (or a Continental derivative?) in the Ariccia hoard.[22]

Anglo-Saxon coins in the Museo Nazionale Romano

Apart from the Forum hoard, a further thirteen Anglo-Saxon coins of the same period are now preserved, without provenance, in the Museo Nazionale Romano. They are brittle and in many cases fragmentary. When we consider them in the context of the other hoards and finds discussed above, it must seem very probable that they, too, are from one or more hoards from the time of Alberic. They may be strays or fragments from one of the known hoards, or they may be from a completely unknown hoard. Six can be identified as coins of Edward the Elder, and three as coins of Athelstan. Four are illegible or fragmentary.

They may be briefly described as follows:

[17] G. di San Quintino, 'Monete del X e dell'XI secolo scoperte nei dintorni di Roma nel 1843', *Memorie della Reale, Accad. delle Scienze di Torino*[2] 9–10 (1849), 1–116, at p. 7.

[18] *NC* Proceedings 1842–1843, p. 104.

[19] Lots 1362–1369.

[20] This coin was sold in 1913 (Sotheby, 17 November) as part of the collection of P.W.P. Carlyon-Britton, with the note, 'This truly remarkable coin was found in the year 1908 at the foot of the walls of the city of Tivoli, the ancient Tibur.' After passing through various collections, the coin is now in the National Museum of Wales, Cardiff.

[21] San Quintino, *loc. cit.*

[22] *Notizie degli Scavi* 1886, 25–26.

Edward

1–3. Wessex. Æthelræd, HP1, HT1 HT1, 1.53g, 1,34g, 1,50g.
4. Wessex. Clip. HT1. 1,28g.
5. London. Deorwald, L-BD/HT1. 1,39g
6. Uncertain. Moneyer –mw–. 0,45g.

Athelstan

7. Kent. Ælfeau. HCO1. 1,22g.
8. Uncertain. Moneyer –if–d. (?Ælfræd, ?Wareham). The coin, which is fragmentary and uncleaned, appears to have a rosette added in the obverse field. 0,70g.
9. Uncertain. Cross type. Moneyer Wulf–. 0.81g.

Uncertain

10. Moneyer –ald. 0,28g.
11–13. Uncertain. 0,47g, 0,32g, 0,32g.

Among the identifiable coins, the proportion of those of Edward to those of Athelstan is so much higher than in the Forum hoard, as to suggest that these coins are from a hoard of *c*. 930. It is merely an assumption, however, that all the coins are from the same source.

COINS WITH AND WITHOUT PORTRAIT

The tradition of issuing coins both with and without portrait, which goes back to the reign of King Offa (757–96), was continued by Edward the Elder and flourished under Athelstan. The two kinds of coins, portrait and non-portrait, were used together and were equal in value. The moneyers who struck portrait coins also struck non-portrait coins, sometimes even from the same reverse die, e.g. nos 59 and 60 in the Forum hoard. We can only speculate why portrait coins were produced. The portrait dies were, obviously, more difficult and expensive to engrave. The only available evidence, which may help us to guess at possible reasons, lies in the concentrated occurrence of portrait coins at particular mints or at particular periods. The Forum hoard offers a uniquely favourable opportunity to analyse the occurrence of portrait coins, because of its large size and because its integrity is certain. (If any coins were removed from a tenth-century hoard by the finder or a middle man, portrait coins would be very obvious ones to choose. They are commercially much more valuable than non-portrait coins, and easy to pick out.)

Among 213 coins of Edward in the Forum hoard there are only thirteen with portrait. These are all southern. It is indeed extremely unlikely that portrait coins were ever struck in north-western Mercia or in the north-eastern I region. All but two of the thirteen can be assigned to the London region. The other two are in the West Saxon style, and have been catalogued as such. Edward's portrait coins, then, are characteristic particularly of the London mint. Most of the London moneyers strike some portrait coins (Beagræd, Beagstan, Deorweald, Ealhstan, Eilafr, Garheard, Grimwald, Leofhelm, Tila), amounting to perhaps a fifth of their output, with no clear evidence that any particular moneyer or moneyers produced a higher than average proportion. The style of the accompanying reverses, with unusually elaborate ornaments above and below the moneyer's name, suggests that these portrait coins fall late in the reign. Perhaps they were not struck indiscriminately alongside non-portrait coins, but were a

separate issue in the 920s. (Portrait coins were also minted earlier in Edward's reign, as the Cuerdale hoard, deposited *c.* 905, demonstrates. But they were not of the kind with the elaborate reverses.) All the moneyers mentioned above continue to work at London under Athelstan, except Beagstan and perhaps Tila.

It is intriguing that more elaborate versions of the reverse type should have been used with portrait dies. We find dies with a trefoil at the top and a cross at the bottom (variety HTC 1, no. 101), or with a cross at the top and a trefoil at the bottom (variety HCT 1, nos. 117, 128, and 129), but most unusually HCT 1 with two added trefoils at the top (HL 1, nos. 123, 130, 131, 135, 136, 138, and 177). If the portrait type represents the final phase of Edward's coinage, there is no need to postulate that these reverse varieties were produced concurrently with the normal HT 1 reverses as a deliberate distinction.

One should mention that, late in Edward's reign, an extensive issue of portrait coins was made for East Anglia, following the extension of the power of Wessex over Danish East Anglia after 920. Here, we need not hesitate to see a political motive. The entire output of the emergency mint whose function was, evidently, to replace the existing currency of the region consisted of portrait coins. The intention was no doubt to bring before the eyes of the East Anglians an image of the English king who was now their king.

If there was a similar intention at London, it was perhaps because the commerce of the Thames brought many foreigners to London, or perhaps because it seemed prudent to remind Londoners themselves, whose interests were tied so closely to overseas trading contacts, that their political loyalties lay with a West Saxon king whose power base was distant from London. This is no more than speculation. What is clear, from the styles of the coins, is that the London die-cutting centre (which must have been under very close royal control) produced portrait dies for most of the London moneyers, late in Edward's reign.

Among Athelstan's early issues there are a few portrait coins with diademed bust in similar style to those of Edward. They are so rare that very little generalization about them is possible. Two are in the London style, by known London moneyers, and may be merely a continuation, in the earliest days of the new reign, of the type that was in issue under Edward. The reverse type, however, is of a circumscription (circular legend) design, and the two known diademed bust/two-line mules are of the common HT 1 variety, rather than the more elaborate HL 1.

Other specimens have obverses in quite different styles, for which no comparanda survive. They include one coin which is almost certainly Kentish. Special issues at the beginning of a reign have no part in the Anglo-Saxon monetary tradition, and it seems unlikely that Athelstan was innovative in this respect. No better explanation, however, suggests itself.

Almost immediately, Athelstan's moneyers reverted to the Two Line type which had been the standard type since the late ninth century. The 'crowned bust' type, so strongly represented in the Forum hoard, was not introduced until *c.* 933. It was the first Anglo-Saxon coinage on which the king was shown wearing a crown, rather than a diadem. Athelstan wears the same crown in an illuminated manuscript of the Life of St Cuthbert (Corpus Christi College, Cambridge, MS 183). There is good evidence that the Crowned Bust coins were a new type, and that they are later in date than the Cross type, in the work of the London mint. The reverse design is changed, some moneyers cease working, and others who begin work only in the Crowned Bust type continue under King Eadmund in the 940s. (Similar evidence from the disappearance of some moneyers and the continuity of others into the following reign can be observed in the work of the Oxford mint.) The full complement of London moneyers (eight were allowed under the Grateley decrees, and nine names are in fact recorded) produce the portrait coins, which were evidently a substantive type in the last few years of Athelstan's reign.

The Cross and the succeeding Crowned Bust types seem to stand in a close relationship to each other. In terms of their designs and legends they mark a distinct change from the traditional Two Line type. The main change of substance was the addition of the name of the mint. Although there was no change in the weight-standard of the coinage, and no significant

improvement in the alloy, the introduction of the Cross type can be seen as amounting to a reform in the minting of the coinage. By naming the mint it identified the moneyer reponsible for a coin more readily and without risk of confusion in cases where there were two moneyers of the same name. The Cross type was struck at about thirty named mints (and there may well have been others, from which no specimens are extant). The puzzling thing about the type is that the major mints do not enjoy their normal numerical superiority. In the Forum hoard, for example, there are only three Cross coins of Winchester, but two from the normally tiny mint of Langport, two from Bath, five from Exeter, and so on.

The Crowned Bust type is known from far fewer mints. One possible explanation of this discrepancy would be that many of the mints in the Cross type worked only until they had satisfied the demands of the 'reform' (by reminting certain categories of obsolete or underweight coins?), and then ceased to be active. The list of mints in southern England striking the Crowned Bust type includes those places which we would expect from eleventh-century evidence to have been major mints, with a continuous demand for moneying, in particular London, Winchester, and Canterbury. If we look at the numbers of specimens of the Cross and Crowned Bust types, and the proportions between them, for those three mints, we see that the Crowned Bust type is far more plentiful,

	Cross	*Crowned bust*	*Ratio*
London	13	48	1:3,7
Winchester	3	11	1:3,7
Canterbury	5	27	1:5,4

with 86 coins altogether. The only other southern mints from which there are important numbers of portrait coins are Oxford (8 specimens) and nearby Wallingford (6 specimens).

Otherwise there are single specimens in the hoard from Hertford, Maldon, Lewes, and Southampton. The last is a Crowned Bust/Two Line mule, of which there is a second specimen from the same dies in Glasgow. In addition there are unique portrait coins from Langport, Rochester, and Wareham. There is no reason to imagine that these rare portrait issues from the southern frontiers of the old East Anglian kingdom, from the south-coast ports, and from the political heartland of Wessex are under-represented in the Forum hoard: indeed, probably the opposite. It is possible that portrait dies were supplied to other mints, but that they were used to strike only a few specimens, so that only one or two should be expected in a sample of hundreds of portrait coins. We should, at least, hesitate to conclude that the minting of portrait coins was deliberately centralized by the withholding of dies from any of the West Saxon mints.

North of the Thames, portrait coins were, as under Edward, the standard issue of the Norwich mint and die-cutting centre. There is also a smaller group of helmeted portrait coins (North-Eastern II), produced by moneyers who also struck a very few Two Line coins, and a further small group with a bust in relief (North-Eastern III), the latter not represented in the Forum hoard. One may judge that each of these three groups of portrait coins is contemporary with the southern Crowned Bust type, that is, they were minted from *c.* 933 onwards.

From the beginning of Eadmund's reign we find only the traditional Two Line type, except in East Anglia, where portrait coins continued to be the standard issue, and in the work of the North-eastern II die-cutting establishment, which continued (for a short time?) to produce helmeted portrait dies.

COOPERATION BETWEEN DIE-CUTTING CENTRES

By 1066 the supply of dies to all the English mints had been centralized. Domesday Book explains, under the entries for Worcester, Hereford, and Shrewsbury, how all the moneyers of England had to buy the dies at London for each new type of coinage, and had also to pay a fee

to the king. The uniform style of the dies confirms that they were produced in a single workshop. In the period before 1066, students have detected a number of different styles in use concurrently, and have seen that in general these styles are regional. This has led them to the theory of 'regional die-cutting centres'. The coins from *c.* 973 onwards, all of which name the mint where they were struck, and which survive in very large numbers, offer the opportunity to test this theory. It is fortunate that they do, for the classification of the coins into stylistic groups is often an exacting task, and sometimes it is not free from subjective judgements as to the number of groups or the number of separate die-cutting establishments involved. Moreover there is considerable overlap, in that at many mints, dies in two or three different styles were used concurrently or indiscriminately. This can best be explained, within the constraints of the theory, by arguing that a mint was supplied with dies, or obtained dies, from more than one regional die-cutting centre. Regional tendencies are, certainly, discernible, but the degree of cross-supply seems often to be more than is consistent with the idea that each mint 'belonged' to one particular centre. At some mints the balance between the sources for the dies is such as to raise doubts about the adequacy of the general theory.

The system of regional die-cutting antedates Eadgar's reform. Already in the period covered by the Forum hoard, virtually all the dies for the English coinage were supplied from a few regional die-cutting centres. In the south of England it seems that there were three, located no doubt in the towns where the most active minting occurred, namely Winchester, London, and Canterbury respectively, for the old kingdoms of Wessex, (Mercia), and Kent. (London, with a complicated political history, had a commercial importance which makes the question whether it was Mercian or West Saxon of secondary importance. The London die-cutters supplied dies to Essex.) North of the Thames there were die-cutting centres for East Anglia and for the 'north-east' (the east midlands). Chester had its own die-cutting establishment in north-western Mercia, while other mints in the same area, such as Shrewsbury, produced coins in similar styles. York cut its own dies, and a further unlocated centre in the north-east was responsible for helmeted portrait coins. Dies with unusual legends were made in the Derby region. There were, then, nine or ten die-cutting establishments, which together accounted for the overwhelming majority of the dies used. Most of the styles are quite distinctive, and specimens can be identified at a glance. The same is not true, however, of the three southern groups, which are relatively uniform in style and are less easily separated from each other.

The mint-signed coins are our starting-point. Coins without mint-signature but by the same moneyers can next be assigned to their regions, if their general style is appropriate. The use of rosettes, for example, is virtually confined to north-western Mercia. We cannot, however, in principle exclude the possibility that two or more moneyers of the same name were at work in different regions. (At the time of the Domesday Survey there seem to have been not fewer than 150 moneyers at work in England, with only about 105 different names. The variety of naming may have been somewhat greater in the tenth century, but it is statistically unlikely that there were not a number of moneyers with the same names.) In cases of conflict, style normally overrides the fact that the name is the same. Occasionally, however, the same name in two styles may reflect a situation where a moneyer drew dies from two centres: the case of Abenel is interesting (see no. 310).

In the catalogue below, the mint-attribution of the unmarked coins has been given with a question mark even when the moneyer signs in other types, because it is just possible that in the course of their careers moneyers moved from one town to another within their region, e.g. from Winchester outwards.

The securely-attributed coins are the basis for a definition of the regional styles. A close study of the three southern styles is needed, as they are so similar. It seems that in Athelstan's reign the Wessex coins regularly have an outer wire border as well as a dotted border, whereas the London coins do not. The Kentish coins are distinguished by a seriffed chevron in the letter M, an obverse cross aligned as an X, and the absence of a wire border. In addition, they

include a varied range of reverse varieties, in a pattern of occurrence quite different from the Winchester or London dies. Athelstan's reign is a firm starting point, because a higher proportion of his coins are mint-signed than in the preceding or the following reign.

For Edward the Elder, the stylistic classification rests on the researches of Lyon, and I am grateful for the benefit of his advice prior to the publication of *Coinage in Tenth Century England*. For Eadmund, the task of deciding on the closer attribution of southern coins seems extremely difficult. Future work on other hoards found in the south may gradually clarify our understanding of Eadmund's issues. His coins in the Forum hoard do not readily fall into three clear-cut groups, which could be defended by objective arguments, and it might even be considered an open question whether the Wessex and London die-cutting centres both remained open throughout the reign.

Even when an attempt has been made, sometimes tentatively, to assign all the coins without mint-signature to their correct regional die-cutting centre, the problem remains that this may not be the same as assigning them to the region where they were struck. By analogy with what we know securely from the eleventh century, there could have been an irregular pattern in the supply of dies, with some mints often obtaining their dies indiscriminately from more than one centre. It would be virtually impossible, for the foreseeable future, to determine where every unsigned coin was struck if it seemed at all likely that dies were cross-supplied between regions on the same scale as sometimes happened in the eleventh century. At best one can identify the sources of the dies.

This problem, on quite a large scale, can be discerned among the coins of Edward the Elder, in the London and Kentish regions, which appear to draw on the West Saxon die-cutting centre, particularly in the earlier stages of their output. The details may be studied in the catalogue, from nos 88 to 162. As will next appear, Athelstan's portrait coins offer us a parallel situation.

Where so much uncertainty prevails, and where difficult hypotheses which are unfalsifiable must be put forward, it is a great relief to be able to turn to these mint-signed portrait coins, the issue of which began in *c.* 933, and to demonstrate from them beyond any doubt that the Wessex die-cutting centre sent dies to London, Canterbury, and Norwich as well as to mints within its own region; that London dies also were sent to Canterbury and Rochester; and that the assistance was nearly all in one direction, namely outwards from Wessex. A consideration in more detail of the moneyers and the numbers of dies involved will suggest that the intention was normally to help a moneyer to make a start in the issue of portrait coins. The same moneyers continued thereafter to strike portrait coins from local dies.

The four main styles of portraiture in the Crowned Bust type, associated with Winchester, London, Canterbury, and Norwich are (fortunately) absolutely distinctive. There need be not the slightest doubt about the source of any particular die, other than a very small proportion of irregular dies. Moreover, because of the exceptionally high representation of portrait coins in the Forum hoard, we have examples from probably about half of all the portrait dies that were used – enough to allow us to suppose that the pattern they form is unlikely to be misleading.

The evidence of the portrait coins is thus of considerable general interest for the history of the tenth-century mints, since it removes from the theory of die-cutting centres, as it refers to the 930s, any suspicion of resting on subjective judgement of style. It also allows one to suggest a sensible reason, in this case at least, for the supply of dies to a mint from a more distant and less obvious source than its local 'centre'. For the monetary historian who seeks to describe the regional composition of the Forum hoard, the evidence is quite encouraging, because it suggests that the cross-supply of dies between regions, in the non-portrait types, may not have been as prevalent as it seems to have become in the eleventh century, and that the regional patterns of the sources of the dies may be a fair approximation to the regional patterns of the minting of coins.

This hopeful view finds some support from the larger groups of non-portrait coins by

individual moneyers. If there are six or more pairs of dies for the same moneyer, and all are in the same style, they tend to show that the obtaining of dies from a distant centre was the exception rather than the rule.

The pattern of supply of the portrait dies

For the reader who wishes to be able to recognize and to assess for himself the various portrait styles discussed below, one enlarged illustration is worth a thousand words. Selected specimens from the Forum hoard have therefore been gathered together, in enlargement, on plates 1–5 of the forthcoming monograph, to facilitate visual comparisons between them. The coins are referred to below by their catalogue numbers, which are repeated on the plates. Detailed comments on the individual coins, and illustrations of their reverses, will be found in the catalogue.

The portrait styles of Athelstan's Crowned Bust coins, which are thought all to be roughly contemporary with each other, have been labelled. 'Winchester', 'Oxford', 'London', 'crude Canterbury', 'careful Canterbury', and 'Norwich' styles. The 'Winchester' and 'Oxford' dies are almost certainly by the same hand, and there are stylistic affinities between the two 'Canterbury' styles. It is however debatable what practical realities lay behind the observed differences: whether there was one die-cutter at Winchester, whose style developed over a period of two or three years, or whether, even, we ought to be thinking about a separated die-cutting establishment at Oxford, to or from which he migrated. The practical reality behind the two 'Canterbury' styles, which are less closely related, is uncertain. There are probably two die-cutters.

What is reasonably certain is that the total numbers of portrait dies were small – 40 or 50 in each of the first three out of the four groups, as estimated from the Forum hoard ('Winchester/Oxford', 'London', 'Canterbury', 'Norwich'), although the last, which rests on only a small sample, may prove on the basis of a wider sample to be seriously underestimated. As the issue continued over a period of years (*c.* 933–*c.* 938?), the amount of work involved could easily have been accomplished by one man at each of the four centres. One man at Winchester, most certainly, and almost as certainly one man at London supplied dies to several moneyers concurrently: the styles are exactly the same on the coins of different moneyers. At Canterbury, as mentioned above, it is probable that there were two die-cutters. At Norwich, it is possible that one man was responsible for nearly all the dies, but if so his style was more fluid.

There are just three or four portrait dies represented in the Forum hoard which are irregular in style, and which might be described as (in one case) a local attempt at Norwich to copy an 'Oxford' die (pl. 2, 615), or a local attempt at an unidentified mint to copy the 'London' style, or (in another case) a rough attempt, at Oxford, at a portrait in a style unrelated to anything else, by an obviously unskilled workman (pl. 2, 507). These few dies are the exceptions.

The 'Winchester/Oxford' style. This is seen on two varieties or designs of obverse, the standard design (pl. 2, 491, 501, 506) and another in which a smaller bust is enclosed in an inner circle. The latter, the so-called Subsidiary Crowned Bust variety (pl. 2, 496) is evidently by the same hand, and later in date (as the career of the moneyer Leofric confirms). It is confined to the Winchester mint, except for one local copy probably from Oxford (no. 509), whereas the standard type was minted elsewhere within the Wessex orbit, e.g. at Oxford, Wallingford, Southampton, Wareham, and Lewes (pl. 2, 501, 506, 513). The style is accomplished, and the bust tends to be tall with a relatively small head. The expression is austere. The hair is curled or rolled at the nape of the neck, and often there are curls on the forehead and framing the face. The double curve at the front of the bust is characteristic, as is a plastic modelling of some of the curves of drapery at the right side of the bust. Dies are supplied to five Winchester moneyers, namely Wulfheard, Regenulf, Amalric, Æthelhelm, and

Otic. Wulfheard and Amalric then cease to work, and Leofric is recruited, and dies for the Subsidiary variety are supplied to Regenulf, Æthelhelm, Otic, and Leofric.

The 'Oxford' style (pl. 2, 498, 502, 504), so called because it is predominant among the Oxford mint coins (but not among those of Wallingford), is almost certainly by the same hand as the 'Winchester' dies, and is found also once at the Winchester mint (pl. 2, 498). The coin which best illustrates the connexion between the two styles is pl. 2, 506, from a die in the 'Winchester' style used at Oxford. Another specimen of the 'Oxford' style is shown at pl. 2, 504. From the number of different dies and, even more, from the number of specimens in the Forum hoard, it is apparent that both Oxford and Wallingford were very active mints in the 930s relative to most provincial mints. The parallel activity at Wallingford perhaps suggests that the monetary context for this activity was the river traffic along the Thames, but the position on the northern borders of historic Wessex may also have been a factor. The question arises whether the 'Oxford' dies belong to an earlier phase than the Subsidiary dies – or an earlier phase, even, than the 'Winchester' dies. As regards the priority of 'Oxford' or 'Winchester' dies (assuming that they are chronologically separate) it is difficult to reach a judgment. The 'Oxford' style dies betray more uncertainties, more experimentation, but on the other hand two mules with earlier types are in the 'Winchester' style (at Winchester and Southampton).

The numbers of different 'Winchester/Oxford' obverse (portrait) dies represented in the Forum hoard, including those from other regions (discussed below) are:

	'Winchester'	*'Oxford'*	*Subsidiary*
Winchester	3	1	4
Lewes	1	–	–
Oxford	1	2	–
Southampton	1	–	–
Wallingford	2	1	–
Sub-total	8	4	4
London	3	2	–
Canterbury	2	–	–
Norwich	–	1	–
Total	13	7	4

The 'London' style. The London portrait gives the impression of younger, and perhaps more plebeian, features. The hair is straight and encloses the face in a close-fitting cap. It is short at the nape of the neck. It is indicated by straight lines which often radiate outwards slightly from a focal point near the chin. The brooch fastening the cloak is represented by a rosette of six or seven dots (pl. 2, 518, 520, pl. 3, 526, 528, 553, 561). On one die the bust is adorned with what seems to be a necklace (pl. 3, 535), prompting the speculation that the moneyer in question might have worked for the queen.

Of the ten London moneyers, all of whom are represented in the Forum hoard, four use 'Winchester/Oxford' dies, and nine use London dies. Eilafr, who is the only one of the ten not recorded in the following reign, relies on a single, heavily-used 'Oxford' style die (pl. 3, 543). He may thereafter have ceased activity. Leofhelm uses a 'Winchester' die heavily, the five specimens in the hoard illustrating its deterioration. Then, with the same reverse die as is used with the 'Winchester' obverse in its most worn state, he uses a new, 'London' style obverse. Grimwald's coins are even more instructive. He first uses two 'Winchester' dies (pl. 3, 547 and 548), of which one is linked with an obviously very early reverse, exhibiting many experimental features subsequently abandoned, such as broad letters G and A, VV in place of a letter wen, an M with a central limb, a small O, and ND ligate. He then uses two more obverse dies of problematic style, the first perhaps an early 'London' product attempting to copy the 'Oxford' portrait (notice the rosette brooch and the misunderstood crown – no. 550) and the other probably merely an early 'London' die (pl. 3, 551). Eventually he uses a normal

'London' die. The fourth moneyer known to have used a non-local die is Ælfstan, whose 'Oxford' die (pl. 2, 517) looks particularly early in style. (The reader should compare it with pl. 2, 498.) Ælfstan also uses a normal 'London' die.

It is possible that, if a higher proportion of all the portrait dies used at London were known to us, we should see that some of the other moneyers also began their issue of the type with a die supplied from Wessex. We might also, of course, find a 'London' die for Eilafr.

The numbers of obverse dies in the Forum hoard used by the ten London moneyers are as follows:

	'Oxford'	*'Winchester'*	*'London'*
Ælfstan	1	–	1
Ælfweald	–	–	4
Beagræd	–	–	4
Beornheard	–	–	3
Eilafr	1	–	–
Grimwald	–	2	2 + 1
Ighar	–	–	2
Leofhelm	–	1	1
Man	–	–	1
Wulfhelm	–	–	1
Total	2	3	20

The Hertford and Maldon mints drew their portrait dies from London (pl. 3, 565, Hertford), as did the moneyer Cynewald (no. 567), the location of whose mint is unknown. Sigewulf shared Cynewald's portrait die of 'London' style, and also used another (pl. 3, 568) which appears to be an imitation of the 'London' style by another hand.

The 'Canterbury' styles. Mint-signed coins of three Canterbury moneyers are found in four styles, namely the 'Winchester' and 'London' styles analysed above, and a 'crude Canterbury' and a 'careful Canterbury' style. There are in addition seven moneyers who strike coins without mint-signature in one or both of the 'Canterbury' styles. Æthelferth, who is one of them, strikes mint-signed coins in the preceding 'cross' type, and may thus be assumed to have worked at Canterbury. Others of the seven are almost certainly moneyers at Canterbury, and all of them are probably Kentish, as there is no reason to imagine that Kent, which needed to receive dies from both Winchester and London, exported any of its own dies to other regions. The evidence has therefore been analysed on the assumption that all coins by moneyers who use 'Canterbury' dies are Kentish.

The 'crude Canterbury' style is crude indeed. The features can only be described as simian (pl. 4, 570) and the execution of the bust sketchy and unfinished. The crescent-shaped curls of hair at nape and brow are characteristic. The drapery is of the simplest – two or three plain parallel curves, which sometimes terminate in pellets before they reach the front edge of the bust. The crown with its three jewelled spikes is a cat's cradle of lines which reveal no understanding of structure (pl. 4, 576, 578, 580).

The 'careful Canterbury' style is rather more presentable, although still inferior to the Wessex and London styles. A prominent almond-shaped eye, with pupil, a rounded cheek, prominent lips, and long hair on the crown (pl. 4, 579, 584, 590) are all distinctive. Note that the bar of the letter edh is regularly nail-shaped, i.e. seriffed only at one end. The brooch fastening the cloak is an annulet, normally with a pellet in its centre. There are two styles of drapery, of which the earlier seems to be copied from the 'London B' style (see the catalogue before no. 517). A coin that is probably experimental (pl. 4, 579) blunders the spelling of the king's name. The other style is a smoothed-out development of the first, characterized by a thickened S-shaped curve (pl. 4, 584 and 590, and see no. 585).

The 'crude Canterbury' style may very well be an attempt to imitate the 'careful

Canterbury' style. Note how the curls of hair at nape and brow are simplified in passing from one style to the other (see pl. 4, 584 and 590 with 580 and 578). As the crude version uses a normally-barred letter edh, and has its own simple style of round-the-shoulder drapery, it will seem that we have to do with two die-cutters.

The work of individual moneyers at Canterbury offers instructive evidence of the supply of reverse as well as obverse dies, and of the spelling of the same man's name in different ways by different die-cutting centres. Ælfric begins work with a set of 'Winchester' dies (pl. 4, 572) and a set of 'London' dies (pl. 4, 573) and subsequently uses the 'Winchester' obverse, by now in a worn condition, with a local reverse die on which his name is spelled *Elfric* rather than *Ælfric* (no. 575). All these are mint-signed coins. He also uses three more portrait dies in 'crude Canterbury' style, of which one (pl. 4, 576) appears to be early in that die-cutter's œuvre. The accompanying reverse dies give his name in the form *Elfric*, and are variable in their treatment of MO or MON. [They all end DOR CIVIT, however, and thus appear to belong to a separate batch from 575, which ends MONETA DO. One would guess that 575 was the earlier.]

The moneyer Æthelsige uses a 'Winchester' portrait die (pl. 4, 582) with a very neat and interesting reverse which seems however to be local, if one may judge by the seriffed letter M. The same reverse is also used with a die in 'careful Canterbury' style (pl. 4, 584). Æthelsige then uses another 'careful Canterbury' obverse, paired with another neat reverse which shows the distinctively barred edh (no. 585).

The coins of Leofing confront us with a difficult judgement. His name is spelled one way on dies in 'London' style (LIOVING) and another way on coins in 'careful Canterbury' style (LIFING). Is this a parallel case to Ælfric/Elfric? As three sets of 'London' dies are represented in the Forum hoard by four coins, and one set of 'careful Canterbury' dies by two coins, it is a finely-balanced question whether we should not propose two moneyers of the same name, and set LIOVING alongside Cyneweald and Sigewulf in the London region. Or perhaps we should adopt an opposite solution, and transfer Cyneweald and Sigewulf (who are anomalous in striking unsigned coins in the London region) to Kent, postulating that, like Leofing, they used dies obtained from the London die-cutting centre.

Ælfeau, of whom we may feel sure from non-portrait types that he is a Kentish moneyer, like Leofing uses the formula MONETA with a 'London' obverse (pl. 4, 569). The reverse of this coin appears to be of London workmanship, too, cf. Ælfric's pair of dies, nos. 573–4. Ælfeau also uses a 'crude Canterbury' obverse (pl. 4, 570), still without naming the mint (ALFEAV MON). He could of course have worked at Dover or elsewhere in the south-east.

[Torhthelm uses an interesting die (no. 592) of clumsy workmanship. The bust is 'Canterbury' style, but is misaligned in relation to the legend and the drapery. The obverse is probably experimental, as it is coupled with a reverse in fresh condition, which is used again in what seems to be a more worn state with a 'careful Canterbury' obverse of normal style, but still with the earlier version of the drapery (see pl. 4, 579). This reverse die reads MO DORC, but another (no. 595) again with the earlier drapery, ends simply MO.

The numbers of obverse dies in the Forum hoard used by Kentish moneyers are as follows.

	'Winchester'	*'London'*	*'crude C.'*	*'careful C.'*
Ælfeau	–	1	1	–
Ælfric	1	1	3	–
Æthelferth	–	–	1	1
Æthelsige	1	–	–	2
Leofing/Lifing	–	3	–	1
Torhthelm	–	–	–	3
Ceolhelm	–	–	–	1
Deorwald	–	–	–	1
Hunsige	–	–	1	–
Manning	–	–	1	–

One may note a Rochester coin in 'London' style (*SCBI London* 151).

The 'Norwich' styles. The die-cutting centre at Norwich was evidently newly-established in the 930s, with a complement of moneyers whose names do not occur in earlier types. As elsewhere, some of them are known to have received portrait dies from Wessex. Giongbeald uses an 'Oxford' die (pl. 5, 606), and Hrodgar a 'Winchester' die (Blunt 284). Both men also use local dies. Secge uses what seems to be a 'Winchester' die (Blunt 287).

Portrait coins in the local style or styles are so variable that they largely defy analysis. It almost seems, dare one say, as if each moneyer has his own style. If a larger body of material were studied, covering a higher proportion of all the dies originally used, more signs of order might begin to emerge. Norwich dies are unlikely to be confused, even at a glance, with those from anywhere else. The elongated eye (pl. 5, 604, 611, 617), the hair piled up (pl. 5, 608), the straight-fronted bust (pl. 5, 610), the replication of the folds of the drapery from the left-hand edge of the bust to the right-hand edge (pl. 5, 608) are all characteristic enough.

Here and there are hints that two moneyers received dies from the same hand. We may detect some similarities between coins of Manticen (no. 616) and Burdel (Blunt 281), or between Giongbeald and Hrodgar (*SCBI London* 142, 144), or between Burdel (pl. 5, 604) and Hrodgar (pl. 5, 610).

Amid so much uncertainty, one may register the conviction that the much-discussed mint-signature *S.Mrie* or S.MRIC on Eadbald's coin (pl. 5, 617) can only belong within the East Anglian orbit: the similarity of the portrait to that used by Manna (pl. 5, 611) offers ample proof that the die is from the Norwich die-cutting centre.

METROLOGY

The Forum hoard provides an exceptional opportunity to analyse the weights of more than 800 coins which have all shared the same history. They were buried together, and have thus suffered the same changes to their weights through corrosion and leaching by ground water. Coins of the same date in the hoard have been in circulation for the same length of time. Most of the coins have been cleaned under similar conditions. All the coins were weighed by the writer on the same electronic balance (a Precisa 310C–3010D) over a period of a few days. Any small differences which may originally have existed between the coins of one mint or region and another, or between one type and another, should therefore be faithfully reflected in the metrological data derived from the hoard, which is, moreover, large enough (although only just large enough) for averages or dispersion patterns based on groups of coins of a kind to be statistically reliable. Comparisons between English hoards of the tenth century have demonstrated that it can be a seriously misleading procedure to attempt to study small differences of this kind from the evidence of a mixture of coins from various hoards. The Forum hoard offers evidence of virtually unique value for the second quarter of the century.

One systematic deficiency should be noted. Many of the coins of Edward the Elder (but relatively very few of those of Athelstan or Eadmund) have lost a smaller or greater part of their rim, as may be judged from the photographs in the catalogue. One may guess that many specimens have lost anything from 0.002 g to 0.01 g in this way. The mean average weights for Edward are therefore almost certainly several milligrammes on the low side in comparison with those for Athelstan and Eadmund. The cause of the damage is evidently that the coins are brittle. It is not obvious why Edward's coins should be more brittle, but that seems to be the case. It may be because they contain less zinc in relation to copper.

The mean average weights of the Forum hoard coins are set out region by region and type by type in Table 5. A uniform weight standard of roughly 1.5 g is evident throughout, with a decline towards roughly 1.25 g among some coins from the time of Eadmund. Within that overall view, there are just one or two regional discrepancies. The most obvious is that the

East Anglian region, after the Norwich mint was re-established late in Athelstan's reign, consistently struck very heavy coins, to an average at least 0.05 g heavier than elsewhere. At York and in the north-eastern II region, by contrast, the coins were slightly lighter than elsewhere. The East Anglian coins before Athelstan's regional reform were distinctly lighter. There seems to be a persistent tendency for Kentish coins to be slightly lighter than other southern coins.

An inspection of the individual weights in the catalogue quickly suggests that many of the averages in Table 5 fall short of a maximum of *c.* 1.52 g not because the constituent weights are systematically a little lower, but because of the inclusion of a few weights that are substantially lower than the average. It appears probable that it is these few below-standard coins which depress the averages erratically, and that we should not therefore attempt to draw any precise conclusions from the mean averages, before exploring this aspect of the evidence by some more appropriate statistical procedure. A different type of average weight may give us a truer indication of the metrological intentions of the workmen who made the coins. The modal value, rather than the mean average, should show us the standard at which the mints were aiming. We shall discover, by drawing histograms, that the upper limit of the weights of individual coins was closely controlled, no doubt by the culling in the mint of too-heavy flans, but that the lower limit was apparently less rigorously maintained. The interpretation of the below-average weights is problematic, and we will have to devote some attention to it, below. First, however, the main point, which is more easily established: modal values give a more consistent overall view of the work of the mints than mean averages, as may be judged by comparing Table 6 with Table 5.

The modal values have been calculated by arranging the weights in step-intervals of 0.1 g, and by adjusting the positioning of the step to the nearest 0.01 g in order to maximize the proportion of the data falling into the central step. The mid-point of the central step is then taken as the mode. Thus for example, if 12 specimens fall between 1.48 g and 1.57 g, but 14 specimens fall between 1.49 g and 1.58 g, and only 11 btween 1.50 g and 1.59 g, the mode will be determined as 1.53/1.54 g rounded up to 1.54 g. For most groups in the Forum hoard, there are not enough specimens to determine the modal value accurately to the nearest 0.01 g. It is, nevertheless, clear that a weight standard of *c.* 1.55 g was used in most regions, and that it persisted into Eadmund's reign. Only East Anglia used a somewhat higher standard.

There are hints of a lower weight-standard in Kent during Athelstan's Two Line type, and in the north, and many of the coins of lower weight from other regions seem to fall around 1.35 g. This raises the important and difficult question whether two weight-standards were in use concurrently, for coins of the same face-value. From the 970s onwards this was the case: elaborate variations in weight-standards were an instrument of royal policy. The evidence for the variation is perfectly clear, although the basic intentions of the policy continue to be debated. From before 973, no good evidence has been found, except in East Anglia, where the Morley St Peter hoard reveals precisely the same two weight-standards, namely 1.35 g (658 specimens of portrait coins of Edward the Elder) and 1.58 g (48 specimens of later two-line coins of Edward the Elder).

A possible procedure to discover whether a 1.35 g standard can be recognized in the Forum hoard is to examine the evidence of the entire hoard, in order to accummulate enough data. A triple histogram has therefore been constructed (fig. 3), showing the pattern of weights for the three reigns of Edward, Athelstan, and Eadmund. All three lines are essentially very similar. They show exactly the same peak, although it is slightly flatter in successive reigns, an indication of a small decline in the care with which the weights of the flans were adjusted. The reader will recall, too, that the coins of Edward are more chipped. Also, the three lines are virtually identical above the peak. Below the peak the lines are rather more erratic, but there is no clear evidence of the same 'shoulder' or subsidiary peak, for example at *c.* 1.35 g, in all three reigns. The detailed evidence, from Kent in Athelstan's Two Line type, and from NE II and York, will account for most of the evidence around *c.* 1.35 g, but even so it involves too

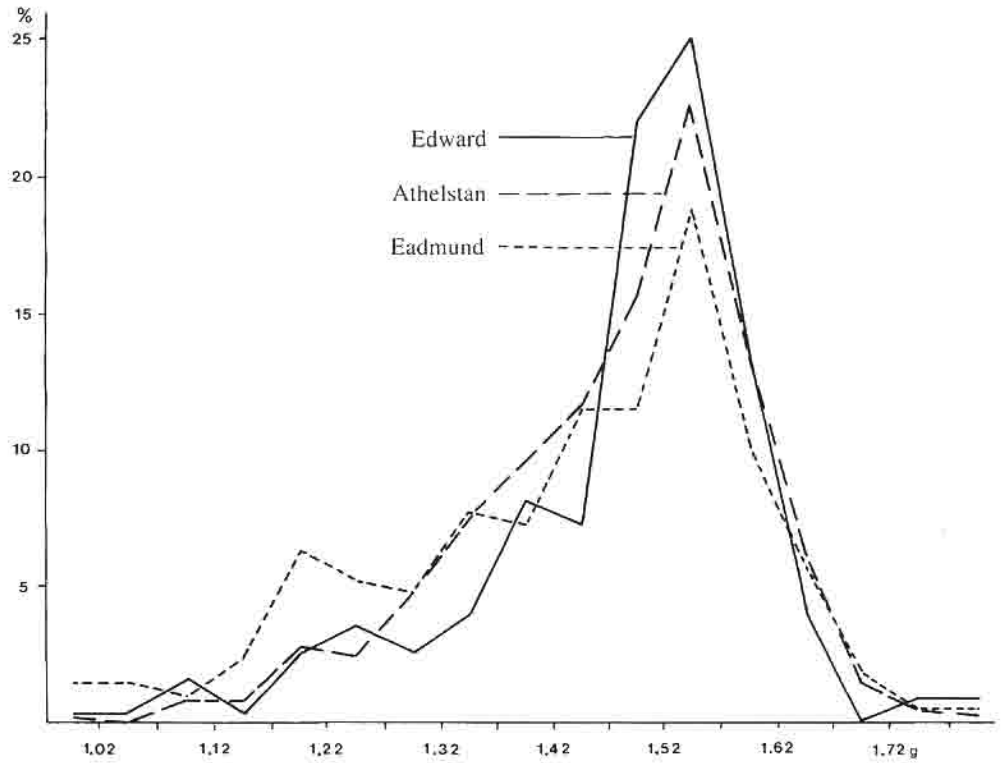

Fig. 3. Histograms of the weights of the coins of Edward, Athelstan, and Eadmund in the Forum hoard (all regions combined).

few coins to make much difference to the overall picture. We have to conclude that the histograms do not help us to interpret the data in that respect, and that in any case the overwhelming impression is of typically negatively skewed histograms, such as are familiar from many another coin series, and which reflect the care taken to cull over-weight flans. The 'tails' of the histograms are partly explained by the less active concern of the mint to cull under-weight flans, and partly by the inclusion of a few broken specimens and perhaps some deliberately sub-standard issues.

There remains the puzzling evidence of little groups of linked under-weight coins, among which attention may be drawn to the following:

Early coins of Edward the Elder, e.g. nos 7–9
Three London coins of Arnulfr, nos 243–5
The Kentish coins of Ælfeau and Herebeau, nos 256–60 and 263–6 (and see 570?)
Two Oxford coins, nos 392–3
Two 'Derby' coins, nos 463–4
Two Wessex coins, nos 645–6
Three Kentish coins by Beorhtræd, nos 714–16, and two by Deorhelm, nos 722–3.
Three Mercian coins of Wigheard, nos 780–2.

Perhaps it is mere coincidence that these linked coins are light, but it is statistically rather improbable.

One may contrast the groups of die-linked coins by Freothubeorht, minted almost certainly at Southampton, which vary sharply in weight, nos 47–57, with die-linked groups that are much more consistent, e.g. Wulfheard's coins, nos 82–6, or those of Ælfstan, nos 659–69.

Finally, attention should be drawn to various individual coins which are blundered or problematic, or doubtfully official, e.g. nos 219, 280, 283–4, 305, 306, 307, 308, 309, 389, 507 and 509, 615, 636, 763–4, 814, 815, and 816.

DIE ALIGNMENT

It is well known that the later Anglo-Saxon coins were struck in such a way that their obverse and reverse designs are usually aligned in relation to each other at an angle corresponding with one of the four points of the compass – conventionally recorded by means of small arrows or by degrees of arc: 0°, 90°, 180°, 270°. Die-alignment is measured by rotating the coin on the vertical axis of its design, and by then recording the north or 0° position of its other face. If Anglo-Saxon dies were aligned in a rectangular relationship, it was presumably because the dies were held in place by some sort of rectangular collar.

If the die-alignment of a coin is observed not to be at one of the four compass points, this could be merely because the design was engraved on the face of one die at an angle to the rectangular collar. It does not prove that a collar was not being used. Better evidence comes from a comparison of die-duplicate coins. Among about eighty pairs of duplicates in the Forum hoard, half comprise two coins with the same die-alignment. About a fifth show a difference of 180° degrees, and about a fifth show a difference of 90°. The remainder show differences unrelated to 90° intervals. A run of ten duplicates (nos 684–93) includes six specimens with a die axis of 135° and four with a die-axis of 315°. Another run of five duplicates (nos 537–41) includes three at 135° and two at 315°. Six duplicates (nos 662–7) are all aligned at 135°.

It should be clear from the above that tabulating the frequency of different die-positions, without reference to die-duplicates, is of limited value as a means of judging whether a rectangular collar was always used. It appears likely that it was very generally used, and that pairs of dies were most often used in the same alignment to each other or reversed by 180°. Unless the collar was square or very nearly so, an alteration of 90° would not have been possible.

In an attempt to extract as much information as possible from the data of die-alignment, we can construct rose-diagrams, showing 24 points of the compass, and search for patterns of difference within the Forum hoard. The die-axes of the coins were all measured by the writer, to the nearest 15° of arc judged by eye. This probably exceeds the sensible limits of refinement, because the designs themselves are not laid out with perfect regularity. In the two-line type one or both of the lines of writing may slope away from the horizontal. The balance of the portrait types is, to within a few degrees, a subjective or aesthetic decision. And it is a matter for careful judgement whether the initial-cross in circumscription types is placed exactly on the intended axis of the design at 0°. Sometimes, a run of coins from the same die-cutting centre makes it clear that the central cross was thought of by the die-cutter as defining the axis of the design, and the initial cross was consistently placed off-centre. If we must allow for probable observational errors of a few degrees, it will be prudent to disregard any small within-sample variations, and to attach significance only to those that are clear-cut.

From the diagrams below (fig. 4) it seems perfectly clear-cut that there were, surprisingly, not four but eight preferred alignments at 45° intervals. We have noted, above, several examples where coins with die-axes of 135° and 315° were struck with a collar. Even allowing for a certain element of imprecision in the writer's recording of the data, there need be no doubt that the die-axes are in reality strongly clustered at intervals of approximately 45°.

It might therefore be appropriate to simplify the presentation of the data by making the rose-diagrams refer to only 8 vectors, 345°–15°, 30°–60°, 75°–105°, and so on (fig. 5).

Three questions suggest themselves. 1.) Were there differences between die-cutting centres,

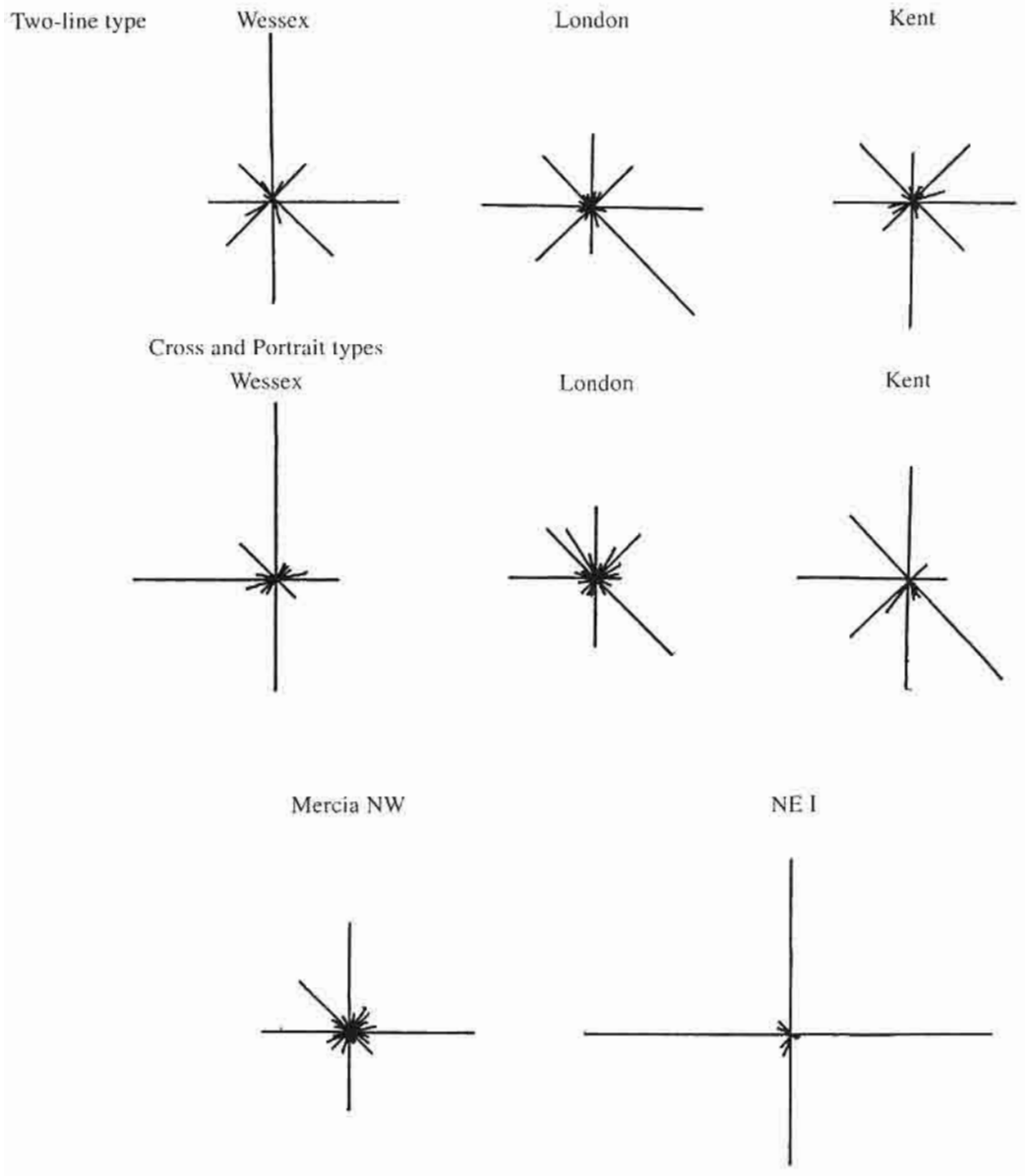

Fig. 4. Rose-diagrams of the die-alignment of coins in the Forum hoard, as measured by eye to the nearest 15° of arc, Top row: the two-line type. Middle row: the cross and crowned bust types together. Bottom row: Mercia, the north-west (Two-line and cross types), North-east I (two-line type). The lengths of the vectors are based on percentage values.

such as would suggest that different practices were traditional locally? 2.) Were there any differences in the patterns as between two-line coins and circumscription or portrait coins? 3.) Were there any changes between the reigns of Edward, Athelstan, and Eadmund?

The rose-diagrams in fig. 5 use percentage values for comparability. The top row of three illustrate the Two Line type at the Wessex, London, and Kentish die-cutting centres. The second row shows the Circumscription Cross and Crowned Bust types (combined) for the same three die-cutting centres. On the third row are diagrams for north-western Mercia and for the north-eastern I centre. The last (NE I) differs significantly from all the others, in that a

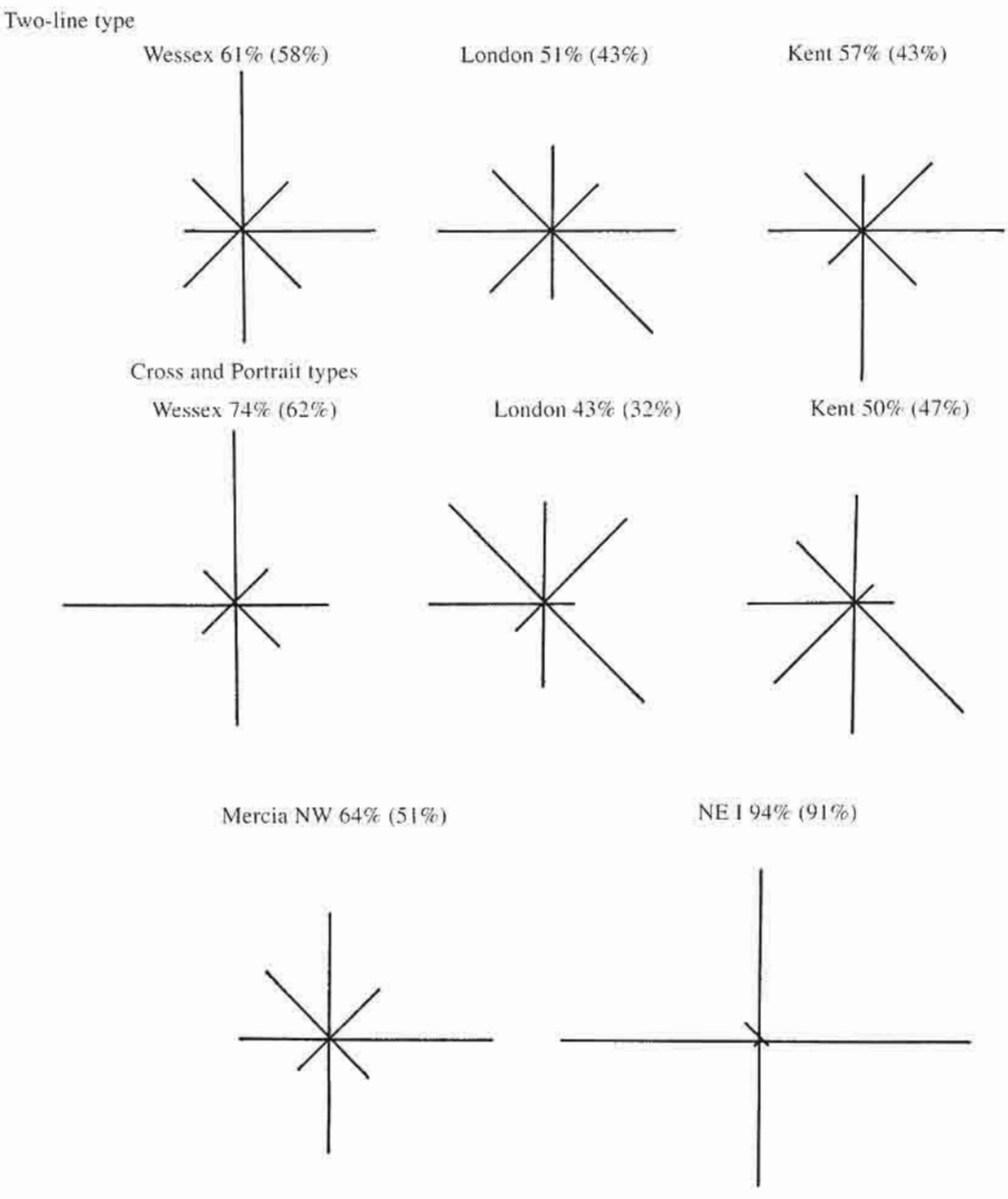

Fig. 5. Rose-diagrams of the die-alignment of coins in the Forum hoard, simplified from 24 to 8 alignments. The percentage figures are the sum of the vectors of the four compass points, followed (in brackets) by the corresponding percentage in Fig. 4.

much higher proportion of the coins, over 90%, is aligned to one of the four compass points. This gives us immediately a positive answer to the first of our three questions.

A more detailed examination of the NE I coins to see whether the minority with irregular die-axes are by particular moneyers or show any special characteristics, produced nothing of note. Two coins from the same dies by Tila are aligned at 135° and 315° (nos 193–4).

Considered together the six rose-diagrams on the first two rows of fig. 5 suggest that there were small differences between the three southern die-cutting centres, but no less observable

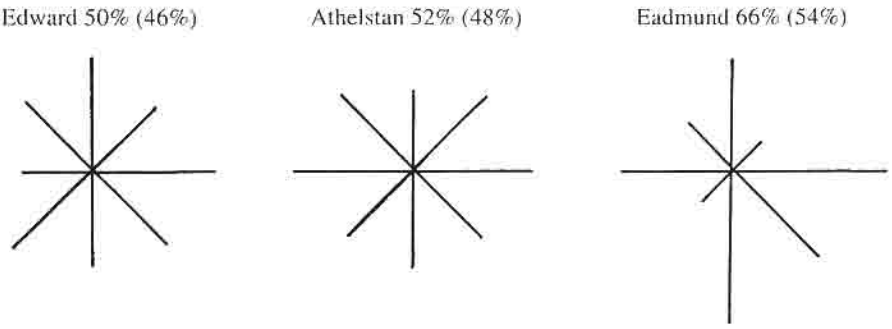

Fig. 6. Rose-diagrams of the die-alignment of coins of the two-line type in the Forum hoard, simplified from 24 to 8 alignments. The percentage figures are the sum of the vectors of the four compass points, followed (in brackets) by the corresponding percentage for 24 alignments.

differences between the Two Line type and the Cross and Portrait types. If the four compass-point alignments out of 24 are totalled, the percentages are highest for Wessex (58%, 62%) and lowest for London (43%, 32%). If we reduce the rose-diagrams to eight vectors, the pattern persists (percentages shown in Fig. 5 in parentheses).

Fig. 6 shows rose-diagrams for all the Two Line coins of Edward, Athelstan, and Eadmund respectively. There is no evidence of any change over time.

Acknowledgements. This article not only rests largely on the original researches of the late C.E. Blunt, but also has benefited at every stage of its preparation from his friendly advice, most generously given. Mr C.S.S. Lyon, whose researches into the coinage of Edward the Elder are as important as those of Mr Blunt for the reign of Athelstan, has also helped unstintingly and with the most disinterested kindness. Dr Veronica Smart gave her expert advice on the meaning of some difficult moneyers' names. It is the convention that editors perform their acts of helpfulness unthanked, but I should like to be permitted to express my gratitude to Dott:ssa Balbi for her unfailing encouragement, and to say how much more agreeable my task was made by the collaboration of Prof:ssa P. Serafin, and of Dr James Graham-Campbell, and by the friendly assistance of Dott:ssa L. Travaini.

APPENDIX

The hooked tags from the Forum hoard, Rome

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Description

Pair of hooked tags of silver, in excellent condition, with incised niello-inlaid text and ornament. Each tag, one being slightly longer than the other, consists of an oval plate with a pair of projecting perforated lugs at one end and a plain hook extending from the other. Two concentric, approximately circular lines, frame the text and there is a trilobate leaf motif in the central field so formed; the outer margin is extended around the lugs. The text, which is executed in Anglo-Saxon capitals, is split between the tags, reading on (i) +DOMNOMA, and on (ii) RINOPAPA+. In both cases the letters read clockwise around the borders, with the crosses placed at the top of the tag immediately below the hook. The reverse of both tags is plain, except that on tag (i) is a crudely executed, V-shaped arrangement of seventeen small pits, outlined with a single incised line, of no apparent significance. Lengths: (i) 4.4 cm; (ii) 4.25 cm.[1]

Discussion

This pair of tags represents a well-known type of Middle to Late Anglo-Saxon hooked fastener of which the finest examples are of niello-inlaid silver with 'Trewhiddle-style' ornament of ninth-century date (Graham-Campbell

[1] The description and measurements are taken from photographs which were kindly made available to me by Dott.ssa Silvana Balbi de Caro through the agency of Dr Michael Metcalf.

1982; Webster & Backhouse 1991, nos 196–8),[2] but similar, simpler tags continued to be made in the tenth and eleventh centuries. The outline foliate design on the Forum hoard tags represents the motif of a bud between a pair of leaves found in ninth-century ornament, as on many 'Trewhiddle-style' strap-ends (e.g. those from Whitby Abbey, North Yorkshire; Wilson 1964, nos 116–22), rather than the more elaborate acanthus-leaf designs which became established in tenth-century Anglo-Saxon art (cf. the ragged acanthus on the nielloed silver plates around the base of the Canterbury censer-cover; ibid., no. 9).

The text on the Forum hoard tags reads +DOMNO MARINO PAPA +, probably to be translated as 'to Lord Pope Marinus'. The form and style of these tags would be consistent with their being contemporary with Marinus I (882–4), but is equally compatible with the pontificate of Marinus II (942–6), as suggested by the evidence of the associated coins. They are thus more or less contemporary with a pair of plain silver hooked tags, triangular in form, found with a hoard of coins in a chalk container, deposited *c.* 963, at Tetney, Lincolnshire (Wilson 1964, nos 86–7). In both instances it seems reasonable to assume that the tags had been in use as purse fasteners. The implication of the Forum hoard tags is therefore that they were made specifically to fasten a purse containing an English offering to the papacy which was still in its original container when deposited in Rome, and that they were still in association with the coins when these were deposited in Rome – perhaps even still with the original container. Traces of fabric survived on at least one coin.

The Forum hoard tags are furthermore of importance in that they are the only pieces of tenth-century Anglo-Saxon ornamental metalwork datable by inscription naming a known historical person; they also represent the only Anglo-Saxon inscription consisting of one text divided between two separate objects.[3]

[2] The tags were published as 'fibulae' by C.E. Blunt in 'The coinage of Athelstan, 924–939: a survey', *BNJ* 42 (1974), 35–160, at p. 141. See also J. Graham-Campbell, 'Some new and neglected finds of 9th-century Anglo-Saxon ornamental metalwork', *Medieval Archaeology* 26 (1982), 144–51, and *The Making of England: Anglo-Saxon Art and Culture AD 600–900*, edited by L. Webster and J. Backhouse (London, 1991), nos 196–8.

[3] I am most grateful to Dr Elizabeth Okasha for her comments on the text and script on the tags, for a fuller discussion of which, see J. Graham-Campbell and E. Okasha, 'A pair of inscribed hooked tags from the Rome (Forum) 1883 hoard', *Anglo-Saxon England* 20 (1991), 221–9.